Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants

NUREG-0654/FEMA-REP-1, Rev. 2 (Draft)

May 2015

FEMA

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COMMENTS ON DRAFT REPORT

Any interested party may submit comments on this report for consideration by the Nuclear Regulatory Commission (NRC) and Federal Emergency Management Agency (FEMA) staff. Comments may be accompanied by additional relevant information or supporting data. Please specify the report number **NUREG-0654/FEMA-REP-1** in your comments, and send them by the end of the comment period specified in the Federal Register notice announcing the availability of this report.

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Mail comments to: Regulatory Affairs Division, Office of Chief Counsel, Federal Emergency Management Agency, 500 C Street, SW., Washington, DC 20472-3100.

For any questions about the material in this report, please contact: Don Tailleart, Division of Preparedness and Response, Office of Nuclear Security and Incident Response, U.S. Nuclear Regulatory Commission, Washington, DC 20555 0001; telephone: 301-287-9257; e-mail: Don.Tailleart@nrc.gov or William Eberst, Technological Hazards Division, National Preparedness Directorate, Federal Emergency Management Agency; telephone: 202-341-4917; e-mail: William.Eberst@fema.dhs.gov.

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ABSTRACT

NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," is a joint NRC and FEMA guidance document. Both agencies use the document to evaluate the adequacy of the emergency plans and preparedness of state, local, and tribal governments within the emergency planning zones (EPZs) surrounding commercial nuclear power plants (NPPs), as well as those of the commercial NPP applicants and licensees. The guidance describes methods that NRC and FEMA staff consider to be acceptable for use in implementing specific parts of each agency's regulations, and may also be used by stakeholders in the preparation of emergency plans.

This NUREG-0654/FEMA-REP-1, Rev. 2 update reflects changes to both NRC and FEMA regulations, guidance, and policies, as well as advances in technology and best practices that have occurred since the document was originally issued in November 1980. This update also incorporates the four supplemental documents and addenda that have been issued in the intervening years, and is intended to modernize the guidance while lessening administrative burden on users.

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PREFACE

NUREG-0654/FEMA-REP-1, Revision 2, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants", integrates nearly 35 years of lessons learned within the Radiological Emergency Preparedness (REP) Program[1] and consolidates and clarifies previous guidance. This document is consistent with NRC and Department of Homeland Security's FEMA regulations[2]. For FEMA and its stakeholders, Revision 2 supersedes Revision 1 of this document, the appendices to Revision 1, the addenda to Revision 1, and Supplements 1-4 of Revision 1. Part B of the Introduction provides information on how NRC applicants and licensees[3] may use this document. Part B also provides information regarding the NRC's plans for using this document and how the NRC staff complies with section 50.109 of Title 10 of the Code of Federal Regulations (CFR), and any applicable finality provisions in 10 CFR Part 52. The decision to revise this document and maintain the joint ownership between NRC and FEMA was agreed upon by the NRC/FEMA Emergency Preparedness (EP) Steering Committee. This update aligns with NRC EP regulations and national preparedness doctrine as directed by the President in directives and supported by the National Preparedness System (NPS)[4]. Additionally, this revision incorporates the REP Program guidance into the NPS, thus ensuring that it is risk- and threat-informed and appropriate for the whole community.

The revised document is the product of a joint NUREG-0654/FEMA-REP-1 Task Force consisting of headquarters and regional staff members of both agencies. Multiple public meetings and call-in sessions were held to engage stakeholders, including Federal partners and state, local, tribal, and industry representatives. Stakeholders provided constructive input to inform the writing process and validate work products.

The Task Force responsible for this revision strived to achieve the same relevance that the original authors accomplished. The concepts within this document have served the radiological community well since first released in 1980 and were embraced by the Task Force during the rewrite process.

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[1] Refers to both NRC and FEMA programs that administer emergency preparedness for commercial nuclear sites and surrounding areas. The programs encompass the plans, training, exercises, and resources necessary to prepare emergency personnel to rapidly identify, evaluate, and respond to emergencies.

[2] This document contains and references information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget (OMB), NRC approval numbers 3150-0011 and 3150-0151. The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number. Pursuant to the Paperwork Reduction Act, FEMA is preparing its Federal Register Notice and certification to the Office of Management and Budget to collect the information required pursuant to 44 CFR Part 350, including NUREG-0654/FEMA-REP-1, Rev.1, as currently referenced in 44 CFR 350.5(a). The title of this collection is OMB Collection 1660-NW91, "Review and Approval of State & Local Radiological Emergency Preparedness (REP) Plans and Preparedness."

[3] In this document, "licensees" refers to licensees of NPPs under 10 CFR Parts 50 and 52, and the term "applicants" refers to applicants for licenses for NPPs under 10 CFR Parts 50 and 52 and all applicants for early site permits (ESPs) with complete and integrated emergency plans submitted under 10 CFR Part 52.

[4] NPS contemporary emergency preparedness guidance includes, but is not limited to, the National Preparedness Goal and System Description; National Planning Frameworks; Comprehensive Preparedness Guide (CPG) 101, "Developing and Maintaining Emergency Operations Plans"; CPG 201, "Threat and Hazard Identification and Risk Assessment (THIRA) Guide"; the core capabilities; the National Incident Management System (NIMS) and Incident Command System (ICS); the Homeland Security Exercise and Evaluation Program (HSEEP); and the Integrated Planning System.

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ACKNOWLEDGMENTS

The NUREG-0654/FEMA-REP-1 Task Force acknowledges the contributions of the Nuclear Energy Institute (NEI), the Conference of Radiological Control Program Directors (CRCPD), and the National Emergency Managers Association (NEMA). The Task Force also acknowledges the contributions made by other Federal agencies, state, local, and tribal government organizations, members of the public, and the nuclear industry.

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ABBREVIATIONS AND ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ANS	Alert and Notification System
CFR	Code of Federal Regulations
Ci	Curie
COL	Combined License
CPG	Comprehensive Preparedness Guide
CRCPD	Conference of Radiological Control Program Directors
DIL	Derived Intervention Level
DRD	Direct-reading Dosimeter
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
ECL	Emergency Classification Level
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EP	Emergency Preparedness
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
ERDS	Emergency Response Data System
ERO	Emergency Response Organization
ESF	Emergency Support Function
ESP	Early Site Permit
ETE	Evacuation Time Estimate
FEMA	Federal Emergency Management Agency
FMT	Field Monitoring Team
FR	Federal Register
FRMAC	Federal Radiological Monitoring and Assessment Center
FRPCC	Federal Radiological Preparedness Coordinating Committee
GE	General Emergency
HAB	Hostile Action-Based
HP	Health Physics
HSEEP	Homeland Security Exercise and Evaluation Program
HSPD-5	Homeland Security Presidential Directive 5
I&C	Instrumentation and Control
ICS	Incident Command System
IT	Information Technology

ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
JIC	Joint Information Center
JIS	Joint Information System
KI	Potassium Iodide
LOA	Letter of Agreement
MOU	Memorandum of Understanding
NDRF	National Disaster Recovery Framework
NEI	Nuclear Energy Institute
NEMA	National Emergency Managers Association
NIMS	National Incident Management System
NOUE	Notification of Unusual Event
NPP	Nuclear Power Plant
NPS	National Preparedness System
NRC	Nuclear Regulatory Commission
NRF	National Response Framework
NRIA	Nuclear/Radiological Incident Annex
NTTF	Near-Term Task Force
OCA	Owner Controlled Area
OMB	Office of Management and Budget
ORO	Offsite Response Organization
OSC	Operations Support Center
PAD	Protective Action Decision
PAG	Protective Action Guide
PAR	Protective Action Recommendation
PKEMRA	Post-Katrina Emergency Management Reform Act
PPD-8	Presidential Policy Directive 8
PRD	Permanent Record Dosimeter
RAC	Regional Assistance Committee
REP	Radiological Emergency Preparedness
SAE	Site Area Emergency
SOARCA	State-of-the-Art Reactor Consequence Analyses
SRPC	Site Radiation Protection Coordinator
TBD	To Be Determined
TEDE	Total Effective Dose Equivalent
THIRA	Threat and Hazard Identification and Risk Assessment
TSC	Technical Support Center
UE	Unusual Event

SECTION I: Introduction

A. BACKGROUND

NRC and FEMA staff prepared this document as part of their responsibilities under the Atomic Energy Act, as amended.[1]

Following the March 1979 Three Mile Island accident, Executive Order 12148 and the President's Statement of December 7, 1979 transferred the Federal lead role in offsite radiological emergency planning and preparedness activities from the NRC to FEMA. FEMA received this assignment because of its responsibilities under Executive Order 12148 to establish Federal policies for and coordinate civil emergency planning, management, and assistance functions and to represent the President in working with state and local governments and the private sector to stimulate vigorous participation in civil emergency preparedness programs.[2] This assignment aligned with FEMA's statutory role in promoting, funding, coordinating, and providing technical assistance for disaster preparedness, as defined in Section 201 of the Disaster Relief Act of 1974.[3] Accordingly, FEMA established the REP program to manage its responsibility for offsite emergency planning and preparedness in areas around commercial NPPs. The NRC retained responsibility for onsite activities.

The NRC Authorization Act of 1980 (Public Law 96-295) directed the NRC to establish emergency preparedness as a criterion for licensing commercial NPPs.[4] Specifically, section 109 of Public Law 96-295 directed the NRC to establish through rulemaking (a) standards, developed with FEMA, for the evaluation of state and local government radiological emergency planning and preparedness and (b) a requirement that the NRC will issue operating licenses only if it determines that there is (i) a state or local emergency response plan compliant with the standards developed with FEMA or (ii) in absence of such a plan, a state, local, or utility emergency response plan that provides reasonable assurance that public health and safety is not endangered by the NPP's operation.[5] Section 109 emphasizes the NRC's overall regulatory responsibility for public health and safety as the licensing agency. The NRC revised its regulations in Part 50 of Title 10 of the CFR to incorporate additional emergency preparedness requirements, including 16 planning standards for onsite and offsite emergency plans as required by Public Law 96-295. FEMA mirrors these 16 planning standards in Part 350 of Title 44 of the CFR.

[1] Pub. L. No. 96-295, Pub. L. No. 83-703

[2] Pursuant to DHS Delegation 9000.1, the DHS Secretary delegated to the FEMA Administrator the authority to perform the functions assigned to the Secretary of Homeland Security in Executive Order 12148, as revoked in part and amended by Section 1 of Executive Order 12673 and Section 52 of Executive Order 13286 of February 28,2003, relating to the Federal Emergency Management Agency.

[3] 42 USC 5131, as amended by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-707, 102 Stat. 4689 (1988). This Act constitutes the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and FEMA programs.

[4] Congress reenacted the provisions of section 109(a)(2) of Public Law 96-295 related to emergency planning in two subsequent laws: section 5 of Public Law 97-415 and section 108 of Public Law 98-553. These laws provided authorization of appropriations for the NRC for fiscal years 1982/1983 and 1984/1985, respectively. Although the laws have since expired, the basic terms of the emergency planning provisions of these laws are contained in both NRC and FEMA regulations.

[5] Pub. L. No. 96-295, § 109 (b)(1)(A)-(B).

B. SCOPE

The focus of this document is on incidents at NPPs that might impact public health and safety. The NRC and FEMA regard all of the planning standards identified within regulations as essential for adequate radiological emergency planning. The evaluation criteria in Section II address those elements and attributes of emergency plans and preparedness programs that are directly tied to meeting the planning standards in 10 CFR 50.47(b) and 44 CFR 350.5(a). The NRC and FEMA evaluate the adequacy of the emergency plans and preparedness programs based on these criteria.

If NRC and FEMA determine that all of the applicable criteria for a planning standard are met, then an emergency plan and preparedness program are considered adequate with regards to that planning standard. If any criteria for a particular planning standard are not met, then the licensee, applicant, or offsite response organization (ORO) needs to address NRC- and FEMA-identified issues with meeting the criteria, provide an acceptable alternative to the criteria, or justify why the criteria do not apply to its emergency plan and/or preparedness program.

This guidance describes, and makes available to the public, methods that the NRC and FEMA staff consider acceptable for use in implementing specific parts of each of the agencies' regulations. The guidance is not a substitute for regulations, and compliance with it is recommended but not required.

Use of This Document

This document provides a common source of guidance for the following audiences:

1. NRC.
2. FEMA and other Federal agencies engaged in the review of state, local, and tribal government planning and preparedness.
3. OROs and tribal governments.
4. NPP applicants and licensees as defined herein.
5. Licensee OROs.

Use by NRC

During regulatory discussions on plant-specific operational issues, the staff may discuss with licensees various actions consistent with staff positions in this document, as one acceptable means of meeting the underlying NRC regulatory requirement. However, unless this document is part of the licensing basis for a facility, the staff may not represent to the licensee that the licensee's failure to comply with the positions in this document constitutes a violation.

The NRC staff does not intend or approve any imposition or backfitting of the guidance in this document. The NRC staff does not expect any existing licensee to use or commit to using the guidance in this document, unless the licensee makes a change to its licensing basis. The NRC staff does not expect or plan to request licensees to voluntarily adopt this document to resolve a generic regulatory issue. The NRC staff does not expect or plan to initiate NRC regulatory action which would require the use of this document. Examples of such unplanned NRC regulatory actions include issuance of an order requiring the use of the document, requests for information under 10 CFR 50.54(f) as to whether a licensee intends to commit to use of this document, or promulgation of a rule requiring the use of this document without further backfit consideration.

If an existing licensee voluntarily seeks a license amendment or change and (1) the NRC staff's consideration of the request involves a regulatory issue directly relevant to this document and (2) the specific subject matter of this document is an essential consideration in the staff's determination of the acceptability of the licensee's request, then the staff may request that the licensee either follow the guidance in this document or provide an equivalent alternative process that demonstrates compliance with the underlying NRC regulatory requirements. This is not considered backfitting as defined in 10 CFR 50.109(a)(1) or a violation of any of the issue finality provisions in 10 CFR Part 52.

For new reactor applications, the NRC staff will use the revision of this document in place six months before the application docket date to conduct the

staff's review, unless the applicant specifies and justifies a different revision to be used. Previous reviews, in progress or completed, for which a licensing decision has not yet been determined will continue to be based on the revision of this document utilized at the start of the review process, unless an applicant requests otherwise.

If a licensee believes that the NRC is either using this document or requesting or requiring the licensee to implement the methods or processes in this document in a manner inconsistent with the discussion in this section, then the licensee may file a backfit appeal with the NRC in accordance with the guidance in NUREG-1409, "Backfitting Guidelines," dated July 1990 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML032230247), and NRC Management Directive 8.4, "Management of Facility-Specific Backfitting and Information Collection," dated October 9, 2013 (ADAMS Accession No. ML12059A460).

Use by FEMA

FEMA, as well as other Federal agencies, use this document to review state, local, and tribal government emergency planning and preparedness.

Findings by FEMA, with regard to the adequacy of emergency preparedness, will be related to the capability of the OROs to respond in a coordinated manner to emergencies at, or related to, particular NPPs. Periodic reviews by FEMA will verify the capability of OROs to implement various aspects of the emergency plan. This will include observation and evaluation of exercises and certain drills.

Use by OROs and Tribal Governments

For OROs participating in the REP program, use of this guidance is recommended during the development and maintenance of radiological preparedness and emergency plans to protect public health and safety in the event of an incident at an NPP.

For a tribal government participating in the REP program, it is recommended that it enters into consultation with both the NRC and FEMA. In such situations where the tribal government determined it would act as an independent entity, it would be appropriate to meet the evaluation criteria marked as applicable for tribal governments. This document does not obligate the tribal governments to use the evaluation criteria to build its emergency plans; however, the tribal governments are highly encouraged to consider the evaluation criteria. Tribal government agreements with states and local governments will dictate the degree to which evaluation criteria will apply. Additional information for tribal governments can be found in Part H.

Use by NPP Applicants and Licensees

NPP applicants and licensees may voluntarily[6] use the guidance in this document to demonstrate compliance with the underlying NRC regulations. For currently approved emergency plans based on NUREG-0654/FEMA-REP-1, Revision 1, changes to these plans using Revision 1 will continue to be evaluated by the NRC using Revision 1. Licensees may also use guidance based on Revision 2 to make emergency plan changes. Any changes based on Revision 2 so used by these licensees will be evaluated by the NRC under Revision 2. Licensees should indicate the revision of NUREG-0654/FEMA-REP-1 on which the changes are based. Applicants and licensees may seek approval of a new emergency plan based on Revision 1, Revision 2, or a combination of Revisions 1 and 2. The NRC will evaluate emergency plans submitted for initial approval using the revision(s) of NUREG-0654/FEMA-REP-1 upon which the plans are based and, once the plans are approved, will evaluate any future emergency plan changes using the revision(s) of NUREG-0654/FEMA-REP-1 upon which each change is based.

Methods or solutions that differ from those described in this document may be deemed acceptable if an applicant or licensee makes available sufficient bases and information for the NRC staff to evaluate whether the proposed alternative(s) demonstrate compliance with the appropriate NRC regulations.

Licensees may use the information in this document for actions which do not require NRC review and approval. This would include, for example, changes to an emergency plan under 10 CFR 50.54(q) that

[6] In this section, "voluntarily" means that the licensee is seeking the action of its own accord, without the force of a legally binding requirement or an NRC representation of further licensing or enforcement action.

do not require prior NRC review and approval. Licensees may use the information in this document or applicable parts to address regulatory issues.

Additional information for ESP applicants can be found in Part I.

Use by Licensee OROs

For licensees fulfilling and/or conducting offsite emergency preparedness roles and responsibilities that would traditionally be addressed by state, local, and/or tribal OROs, it is recommended that the Licensee ORO address the evaluation criteria for any of the non-participating OROs within this document. FEMA will continue to evaluate the offsite portion of the planning standards regardless of whether the Licensee ORO or OROs are performing the offsite preparedness and response functions.

Document Hierarchy

This document is a joint NRC/FEMA guidance document. It contains the planning standards solely as a means of referencing the regulations and organizing the evaluation criteria. This document is considered the main source of joint guidance and does not describe regulatory requirements.

The evaluation criteria address overall emergency preparedness program and preparedness capabilities. The level of detail that should be provided in emergency plans to describe these capabilities, and allow NRC/FEMA staff to determine whether the evaluation criteria are met, is further amplified in the NRC EP Handbook (NUREG-[TBD]) and the FEMA REP Program Manual. Additional information regarding various means by which evaluation criteria may be addressed, such as examples of acceptable methods, is also provided in NUREG-[TBD] and the FEMA REP Program Manual.

This document is intended to work in concert with the NPS, as NPS principles and planning concepts are considered to be complementary to those mentioned within this document.

Alternative Approaches

Alternative approaches provide an opportunity for state, local, and tribal governments, applicants, and licensees to meet the planning standards in a manner that is different from what the evaluation criteria recommend within this guidance document. While an alternate approach does not relax the requirements of the planning standards, it provides an opportunity to propose an alternative method for meeting the intent of the planning standards. The specific proposal and approval process is further explained within NUREG-[TBD] and the FEMA REP Program Manual.

C. PLANNING BASIS

Background

The 1978 NRC/Environmental Protection Agency (EPA) Task Force Report on Emergency Planning, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants, NUREG-0396, EPA 520/1-78-016," (herein referred to as NUREG-0396) provides a planning basis for offsite emergency preparedness efforts considered necessary and prudent for large power reactor facilities. Since the NRC's policy statement of October 23, 1979 (44 Federal Register [FR] 61123), the NRC staff has incorporated the guidance in the report into EP regulations and guidance documents.

The overall objective of emergency response planning is to provide dose savings for a spectrum of incidents that have the potential to produce offsite doses in excess of the current Federal protective action guides (PAGs). Plans should not be limited to a single specific accident sequence or incident, as each incident could have different consequences, both in nature and degree. Further, the range of options for a planning basis is very large, starting with the requirement for no planning when significant offsite radiological consequences are unlikely to occur, to planning for the worst possible incident, regardless of its extremely low likelihood. NUREG-0396 did not attempt to define a single accident sequence or even a limited number of sequences. Rather, it identified the bounds of the parameters for which planning is recommended, based on knowledge of the potential consequences, timing, and release characteristics for a spectrum of incidents.

Emergency preparedness is related to two predominant exposure pathways. They are the:

a. Plume exposure pathway – The principal exposure sources from this pathway are: (a) whole body external exposure to gamma radiation from the plume and from deposited material; and (b) inhalation exposure from the passing radioactive plume. The duration of the release leading to potential exposure could range from 30 minutes to days. For the plume exposure pathway, shelter and/or evacuation would likely be the principal immediate protective action recommended for the general public. Administration of a radioprotective drug may also be considered. The ability to best reduce potential exposure under the specific conditions during the course of an incident should determine the appropriate response.

b. Ingestion exposure pathway – The principal exposure from this pathway would be from ingestion of contaminated water or foods such as milk, fresh vegetables, or aquatic foodstuffs. The duration of potential exposure could range from hours to months or years. For the ingestion exposure pathway, the planning effort involves the identification of major exposure pathways from contaminated food and water and the associated control and interdiction points and methods. The ingestion pathway exposures in general would represent a longer-term concern, although some early protective actions to minimize subsequent contamination of milk or other supplies should be initiated.

Separate Federal guidance is provided for these two exposure pathways, although emergency plans for a particular site will include elements common to assessing or taking protective actions for both pathways.

Emergency Planning Zones (EPZs)

EPZs are defined as the areas for which planning is needed to assure prompt and effective actions can be taken to protect the public in the event of an incident. The EPZs associated with each NPP must be defined both for the shorter-term plume exposure pathway and the longer-term ingestion exposure pathway. Plans for addressing incidents are applied by the response organizations in these zones as applicable. The choice of the size of the EPZs represents a judgment on the extent of detailed planning, which must be performed to ensure an adequate response base. During a particular incident, protective actions may be restricted to a small part of the EPZ, while the worst possible incidents may necessitate protective actions be taken outside the EPZs.

The current NRC EP policy, regulation, and guidance, as stated in the "EPA Policy Statement; Planning Basis for Emergency Responses to Nuclear Power Reactor Accidents," 45 FR 2893, is "The EPZ for airborne exposure has a radius of about 10 miles; the EPZ for contaminated food has a radius of about 50 miles. Predetermined protective action plans are needed for the EPZs. The exact size and shape of each EPZ will be decided by emergency planning officials after they consider the specific conditions at each site.

The size of the plume exposure pathway EPZ was based primarily on the following considerations:

a. projected doses from the traditional design basis accidents would not exceed Federal PAG levels outside the EPZ.

b. projected doses from most core melt sequences would not exceed Federal PAG levels outside the EPZ.

c. for the worst core melt sequences, immediate life threatening doses would generally not occur outside the EPZ.

d. detailed planning within 10 miles would provide a substantial base for expansion of response efforts in the event that this proved necessary.

The NRC/EPA Task Force concluded that it would be unlikely that any protective actions for the plume exposure pathway would be required beyond the plume exposure pathway EPZ. Also, the plume exposure pathway EPZ is of sufficient size for actions within this zone to provide substantial reduction in severe early-stage health effects in the event of a complete core melt.

The size of the ingestion exposure pathway EPZ was based on the following considerations:

a. the downwind range within which contamination will generally not exceed the Federal PAGs is limited to about 50 miles from a NPP because of wind shifts during the release and travel periods.

b. there may be conversion of atmospheric iodine to chemical forms which do not readily enter the ingestion pathway.

c. much of any particulate material in a radioactive plume would have been deposited on the ground within about 50 miles from the facility.

d. the likelihood of exceeding ingestion exposure pathway PAG levels at 50 miles is comparable to the likelihood of exceeding plume exposure pathway PAG levels at 10 miles.

Time Factors Associated with Releases

Studies conducted since 1980 (i.e., NUREG-1935, NUREG/CR-7177, and NUREG-1953) have shown that core damage within 30 minutes is possible. Core damage by itself will result in a declaration of a General Emergency (GE) with or without a significant offsite release. This being the case, the EP planning basis that requires rapid response mobilization remains appropriate. Under extreme circumstances a release is possible within approximately an hour of event initiation (NUREG/CR-7160). NUREG-[TBD] provides guidance on developing protective action strategies to minimize public exposure in such events.

Radiological Characteristics of Releases

Planners will need information on the characteristics of potential radiological releases in order to specify the characteristics of monitoring instrumentation, develop dose projections, and identify critical exposure modes.

For atmospheric releases from NPPs, three exposure modes have been identified. The three exposure modes are: (a) whole body (bone marrow) exposure from external gamma radiation and from ingestion of radioactive material; (b) thyroid exposure from inhalation or ingestion of radioiodines; and (c) exposure of other organs from inhalation or ingestion of radioactive materials.

Radioactive materials produced in the operation of NPPs include fission products, transuranics, and activation products generated by neutron exposure of the structural and other materials within and immediately around the reactor core. The fission products consist of a very large number of different kinds of nuclides, almost all of which are initially radioactive. The amounts of these fission products and their potential for escape from their normal places of confinement represent the dominant potential for consequences to the public. Radioactive fission products exist in a variety of physical and chemical forms of varied volatility. Virtually all activation products and transuranic elements exist as non-volatile solids. The characteristics of these materials show quite clearly that the potential for releases to the environment decreases dramatically in this order: (a) gaseous materials, (b) volatile solids, and (c) non-volatile solids. For this reason, guidance for source terms representing a hypothetical fission product release from an NPP emphasizes the development of plans relating to the release of noble gases and/or volatiles such as cesium. Consideration of particulate materials, however, should not be completely neglected. For example, the capability to determine the presence or absence of particulate radionuclides will be needed to identify requirements for additional resources.

Continuing Assessment of the Planning Basis for Emergency Preparedness and Response

Accident phenomena and offsite consequences of severe reactor incidents have been the subject of considerable research over the last several decades resulting in more detailed, integrated, and realistic studies. The NRC initiated the State-of-the-Art Reactor Consequence Analyses (SOARCA) project to develop best estimates of the offsite radiological health consequences for potential severe reactor incidents. By applying modern analytic tools and techniques, the SOARCA project evaluated plant improvements and changes not reflected in earlier studies, including improvements in training, emergency procedures, mitigation efforts, offsite emergency response, and security-related improvements. The SOARCA analyses show that emergency response programs, implemented as planned and practiced, reduce the risk of health consequences among the public during a severe reactor incident.

D. COORDINATED GOVERNMENT EMERGENCY PLANNING

The concept of radiological emergency planning emphasizes a coordinated response process involving several levels of government – Federal, state, local, and tribal – located (wholly or partially) within the plume and/or ingestion exposure pathway EPZs. For the purposes of this document, it is not necessary to outline the varied governmental and jurisdictional structures that exist throughout the United States, nor is it necessary to describe in detail the varied emergency planning and preparedness mechanisms that can be developed among these governmental entities. Additional information regarding integrating and synchronizing efforts across various levels of government can be found in CPG 101, "Developing and Maintain Emergency Operations Plans."

Threat and Hazard Identification and Risk Assessment (THIRA) Considerations

State, local, and tribal officials have the primary legal authority and responsibility to protect their citizens or members and respond to disasters and emergencies. These officials are encouraged to use the THIRA process detailed in CPG 201, "Threat and Hazard Identification and Risk Assessment Guide" to develop an understanding of a jurisdiction's risks and inform decisions about manage those risks. The THIRA process standardizes the risk analysis process that emergency managers and homeland security professionals use every day through the normal course of their work. The THIRA process builds on existing state, local, and tribal THIRAs generally by:

- Broadening the threats and hazards considered to include human-caused threats and technological hazards.
- Incorporating the whole community into the planning process, including individuals, families, businesses, faith-based and community organizations, nonprofit groups, schools and academia, media outlets, and all levels of government, including state, local, tribal, and Federal partners.
- Providing increased flexibility to account for community-specific factors.

Organizations that participate in the REP Program have identified a nuclear/radiological threat as part of their jurisdictional THIRA. The planning guidance that follows in Section II provides additional detail and considerations regarding a nuclear/radiological threat and should be used to inform plans on this specific hazard.

E. INTEGRATED GUIDANCE AND CRITERIA

NRC and FEMA have created and integrated guidance in this document intended for use by applicants/licensees and state, local, and tribal governments to guide their integrated emergency planning and preparedness activities. An integrated approach to the development of emergency plans is the most effective way to protect the health and safety of the public. NRC and FEMA recognize that applicants/licensees and state, local, and tribal government emergency plans should not be developed independently. If a nuclear incident occurs, the public is best protected when efforts by all response organizations are fully integrated. Each organization involved must have a clear understanding of the role it will play in the response to a nuclear incident, and associated level of preparedness to build and sustain. This understanding is best achieved through integrated plan development and evaluation. Each organization must have a clear recognition of its portion of the overall shared responsibility for safeguarding public health and safety. This integrated guidance also allows each organization to understand the capabilities, responsibilities, and obligations of the other organizations.

This integrated guidance provides reviewers the basis to conduct a thorough analysis of each organization's plan and to understand the relationship of all plans in the integrated effort.

F. FORM AND CONTENT OF PLANS

This guidance does not specify a format for emergency plans, but it is important that the evaluation criteria are addressed fully and clearly, as outlined in "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (NUREG-0654/FEMA-REP-1). The plans should address what is to be done in an emergency, how it is to be done, and by whom.

The NPS contains a number of concepts that assist applicants/licensees and state, local, and tribal government agencies with their planning. CPG 201 and CPG 101 are NPS resources that can be used as conduits to the National Response Framework (NRF) and National Disaster Recovery Framework (NDRF). CPG 201 provides communities with additional guidance for conducting a THIRA and presents the basic steps of the process. CPG 101 provides guidance for developing emergency plans and promotes understanding of risk-informed planning and preparedness. Together, these two CPGs provide a risk-informed basis for the offsite planning effort, as well as encourage the engagement of the whole community to address all risks that might impact a jurisdiction and allow for the radiological emergency plan to be integrated with all-hazards plans.

The NRF, Nuclear/Radiological Incident Annex (NRIA) identifies Federal assets that are available for OROs. OROs are encouraged to incorporate Federal assets that may be used in state, local, and tribal emergency plans. Details of Federal roles, responsibilities, and assets are provided in the NRF as well as individual agency plans and manuals.

NPP licensees have a primary responsibility for planning and implementing emergency measures within owner controlled areas. These emergency measures include mitigative actions at the site and protective measures and aid for onsite personnel. Because licensees may not have sufficient resources to do this alone, licensee emergency plans should address advanced arrangements with state, local, and tribal organizations for special emergency assistance.

Long-term, licensees and OROs are responsible for recovery from any radiological incident and return to affected areas. Emergency plans should identify the organizations responsible for recovery actions, which would include a combination of Federal and private entities.

G. TRIBAL GOVERNMENTS

A historic relationship exists between the Federal government and tribal governments. FEMA acknowledges the inherent sovereignty of Indian and Alaska Native tribal governments. Indian and Alaska Native tribal governments are not political subdivisions of states, but are recognized by the United States as distinct sovereign entities. Each tribal government establishes its own priorities and goals for the welfare of its membership. FEMA encourages cooperation and partnership between and among Federal, state, local, and tribal governments and public and private entities.[7]

NRC interaction with tribal governments is addressed in 10 CFR 61.71, "State and Tribal government consultation," which states: "Upon request of a State or tribal governing body, the Director shall make available Commission staff to discuss with representatives of the State or tribal governing body information submitted by the applicant, applicable Commission regulations, licensing procedures, potential schedules, and the type and scope of State activities in the license review permitted by law. In addition, staff shall be made available to consult and cooperate with the State or tribal governing body in developing proposals for participation in the license review."

[7] See Executive Order 13175 of November 6, 2000, Consultation and Coordination with Indian Tribal Governments (65 Fed. Reg. 67249, Nov. 9, 2000); Memorandum of November 5, 2009, Tribal Consultation (74 Fed. Reg. 57881, Nov. 9, 2009); and FEMA Tribal Policy (June 29, 2010).

H. CRITERIA FOR EMERGENCY PLANNING IN AN EARLY SITE PERMIT (ESP) APPLICATION

Emergency Planning Provisions of the Rule

The NRC promulgated 10 CFR Part 52 to govern the issuance of ESPs, standard design certifications, combined licenses (COLs), standard design approvals, and manufacturing licenses for NPPs. Part A of the rule sets out the requirements and procedures applicable to NRC issuance of ESPs for approval of a site or sites for one or more NPPs separate from the filing of an application for a construction permit or COL for such a facility. Subpart A includes provisions for addressing emergency planning issues before any construction permit or COL proceeding.

After meeting the mandatory requirement of 10 CFR 52.17(b)(1), the applicant may also exercise one of the two following options:

- Option 1: Propose major features of the emergency plans, such as the exact sizes of the EPZs, for review and approval by NRC, in consultation with FEMA, in the absence of complete and integrated emergency plans. Major features are defined in 10 CFR 52.1(a).
- Option 2: Propose complete and integrated plans for review and approval by the NRC, in consultation with FEMA, in accordance with the applicable provisions of 10 CFR 50.47.

For the mandatory requirement and Option 1, the application must include a description of contacts and arrangements made with Federal, state, local, and tribal governmental agencies with emergency planning responsibilities. Under Option 2, the applicant shall make good faith efforts to obtain from the same government agencies certifications that: (1) the proposed emergency plans are practicable; (2) these agencies are committed to participating in any further development of the plans, including any required field demonstrations; and (3) that these agencies are committed to executing their responsibilities under the plans in the event of an emergency. The application must contain any certifications that have been obtained. If these contracts, arrangements, or certifications cannot be obtained, the application must contain information, including a utility plan as specified in 10 CFR 50.47(c)(1), sufficient to show that the proposed plans provide reasonable assurance that adequate protective measures will be taken in the event of a radiological emergency at the site.

Subpart B of 10 CFR Part 52 addresses the requirements and procedures applicable to standard design certifications. Emergency planning requirements under Subpart B are limited primarily to the specification of an onsite Technical Support Center (TSC) and an onsite Operations Support Center (OSC) within the design bases of the standard plant design. Subpart C of the rule addresses the requirements and procedures applicable to the issuance of a COL for an NPP. Under Subpart C, the application must contain emergency plans which meet the emergency planning standards of 10 CFR 50.47 and the requirements of Appendix E to 10 CFR Part 50, and thus provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the site. If the application for a COL references an ESP, the application may incorporate by reference emergency plans, or major features of emergency plans, approved in conjunction with the issuance of the permit.

Identification of Physical Characteristics

The ESP application must identify physical characteristics unique to the proposed site, such as egress limitations from the area surrounding the site that could pose a significant impediment to the development of emergency plans. An ESP applicant may identify such unique physical characteristics by performing a preliminary analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations, noting major impediments to the evacuation or other protective actions.

The evacuation time estimate (ETE) analysis is an emergency planning tool that can be used to assess, in an organized and systematic fashion, the feasibility of developing emergency plans for a site. The process for developing an ETE analysis, including specific guidance for ESP and COL applicants, is provided in NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies." Such an ETE analysis serves to demonstrate if any physical characteristics or combination of physical characteristics of the site, egress limitations in particular, could pose impediments to the development of emergency plans. It is important to note that the value of the ETE analysis is in the methodology required to perform the analysis rather than in the calculated ETE times. While lower ETEs may reflect favorable site characteristics from an emergency planning standpoint, there is no minimum required evacuation time in the regulations which a licensee or an applicant has to meet. Accordingly, the ETE analysis should not focus on the numerical time estimates, but on the site factors that are considered to be impediments to emergency planning and preparedness. The reasons should be given for ETEs that appear unduly high. Any major difficulties for an evacuation or the taking of other protective actions, such as sheltering in the plume exposure pathway EPZ, should be discussed.

Major Features of Emergency Plans

Emergency Planning Zones (EPZs)

An ESP applicant that chooses the option of proposing major features of the emergency plans (i.e., applicant, state, local, and tribal plans) should give special emphasis to the exact sizes of the EPZs. The exact size and configuration of the EPZs surrounding a particular NPP should be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries [10 CFR 50.47(c)(2)]. Plume exposure pathway EPZ boundaries that run through the middle of schools or hospitals, or that arbitrarily carve out small portions of governmental jurisdictions should be avoided [CLI 89-12, 26 NRC 383 (1987)]. Additional information concerning EPZs is contained in Part C of this document and 44 CFR 350.7.

Planning Standards and Evaluation Criteria

An ESP application that includes major features of emergency plans will be evaluated against the emergency planning standards and evaluation criteria in Section II of this document. The evaluation criteria for each of the planning standards should be fully addressed. If the applicant cannot or chooses not to address any of the evaluation criteria associated with a particular planning standard, the resolution of those evaluation criteria should be addressed in the ESP application (e.g., stating that the missing evaluation criteria will be addressed at the COL application stage). While the regulations do not address the use of inspections, tests, analyses, and acceptance criteria (ITAAC) for emergency planning for the ESP major features option, the inclusion of a limited set of EP ITAAC in the application, associated with evaluation criteria that are not addressed, is not prohibited. The guidance in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 14.3.10, including generic EP ITAAC Table 14.3.10-1, may be used by the applicant to identify a limited set of possible EP ITAAC that may be appropriate for an ESP major features application.

Complete and Integrated Plans

An ESP application that includes complete and integrated emergency plans will be evaluated against the emergency planning standards and evaluation criteria in Section II of this document. The application must also include any proposed EP ITAAC information required under 10 CFR 52.17(b)(3). The guidance in NUREG-0800, Section 14.3.10, including generic EP ITAAC Table 14.3.10-1, may be used by the applicant to identify a set of possible EP ITAAC that may be appropriate for an ESP complete and integrated emergency plan application.

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SECTION II: Planning Standards and Evaluation Criteria

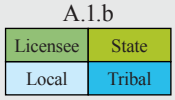
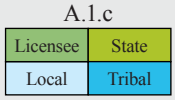
INTRODUCTION

Section II of NUREG-0654/FEMA-REP-1 contains evaluation criteria for each planning standard of 10 CFR 50.47(b) and 44 CFR 350.5(a) that provide specific guidance for developing radiological emergency plans. The colored boxes to the left of each criterion's text indicate applicability, which has been divided into four categories that represent (1) NRC applicants/licensees and organizations at the (2) state, (3) local, and (4) tribal government levels. When a box is colored in and labeled, it indicates that the corresponding criterion may be applicable to organizations in that category. Although a category box may be highlighted for a certain criterion, there can be exceptions or variations to the actual implementation within emergency plans. Users of this document may reference the more specific guidance found in NUREG-[TBD] and the FEMA REP Program Manual for further details and clarification.

A: ASSIGNMENT OF RESPONSIBILITY

Primary responsibilities for emergency response by the nuclear facility licensee, and by State and local organizations within the EPZs have been assigned, the emergency responsibilities of the various supporting organization have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

Regulatory References: 10 CFR 50.47(b)(1); 44 CFR 350.5(a)(1)

Number & Applicability	Evaluation Criteria
A.1 	The Federal, state, local, tribal, licensee, and other private sector organizations that comprise the overall response for the EPZs are identified.
A.1.a 	The organizations having an operational role specify their concept of operations and relationship to the total effort.
A.1.b 	Each organization's emergency plan illustrates these interrelationships in a block diagram.
A.1.c 	Each organization identifies the individual, by title/position, who will be in charge of the emergency response.

Number & Applicability	Evaluation Criteria
A.2 State / Local / Tribal	References to the applicable acts, codes, or statutes that provide the legal basis for emergency response-related authorities, including those that delegate responsibility and authority to state, local, and tribal governments are included. Each emergency plan indicates who may declare a "State of Emergency" and the powers that ensue.
A.3 Licensee / State / Local / Tribal	Each organization specifies the key individual(s), by title/position, responsible for the following functions, applicable to their organizations: command and control, alerting and notification, communications, public information, accident assessment, public health and sanitation, social services, fire and rescue, traffic control, emergency medical services, law enforcement, transportation, protective response (including authority to request Federal assistance and to initiate other protective actions), and radiological exposure control.
A.4 Licensee / State / Local / Tribal	Written agreements with the support organizations having an emergency response role within the EPZs are included. The agreements describe the concept of operations, emergency measures to be provided, mutually acceptable criteria for their implementation, and arrangements for exchange of information.
A.5 Licensee / State / Local / Tribal	Each principal response organization is capable of continuous operations for a protracted period. The principal response organization specifies the individual, by title/position, who is responsible for ensuring continuity of resources (technical, administrative, and material).

B: ONSITE EMERGENCY ORGANIZATION

On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities are specified.

Regulatory References: 10 CFR 50.47(b)(2); 44 CFR 350.5(a)(2); 10 CFR Part 50, Appendix E, Sec. IV.A

Number & Applicability	Evaluation Criteria
B.1 Licensee	Each licensee and applicant specify how they meet the requirements of 10 CFR 50.47(b)(2) and the applicable sections of Appendix E to 10 CFR Part 50.
B.1.a Licensee	Licensees develop the onsite emergency response organization (ERO). Note that while other site programs, such as operations, fire response, rescue and first aid, and security, may be controlled via other licensing documents, it is only when these personnel are assigned ERO functions do they become part of this regulatory standard. Consideration is given to ensure that ERO functions are not assigned to individuals who may have difficulties performing their ERO function(s) simultaneously with their other assigned (non-ERO) functions. Appendix E to 10 CFR Part 50 requires licensees to perform an on-shift staffing analysis to ensure on-shift staff can support the ERO functions assigned, as well as other assigned duties.
B.2 Licensee	An individual is designated as emergency coordinator (individual title may vary) who is on-shift at all times and who has the authority and responsibility to immediately and unilaterally initiate any emergency actions, including providing protective action recommendations (PARs) to authorities responsible for implementing offsite emergency measures.
B.2.a Licensee	The functional responsibilities assigned to the emergency coordinator are established and the responsibilities that may not be delegated to other members of the ERO are clearly specified. Examples of the responsibilities that should not be delegated are the decision to notify and to recommend protective actions to responsible offsite authorities.
B.3 Licensee	Each licensee and applicant develop a table depicting the site-specific on-shift staffing plan, as well as the ERO staffing augmentation plan. Table B-1, "Emergency Response Organization (ERO) Staffing and Augmentation Plan," provides a model for licensees to consider.
B.4 Licensee	The interfaces between and among the licensee functional areas of emergency activity, local services support, and state, local, and tribal government response organizations are identified. The information includes all licensee emergency response facilities.
B.5 Licensee	The contractor and private organizations that may be requested to provide technical assistance to and augmentation of the emergency organization, as applicable, are specified.

Table B-1: Emergency Response Organization (ERO) Staffing and Augmentation Plan

NOTES

- The minimum number of personnel assigned ERO functions (minimum staffing) is dependent on specific licensee requirements and is as approved by the NRC for the site-specific emergency plan. Control of the site-specific emergency plan is regulated via 10 CFR 50.54(q).
- This table lists the basic functions needed to implement the typical emergency plan. It is intended to provide a model for applicants and licensees to consider in the development of their site-specific emergency plan. The minimum on-shift staffing and ERO augmentation needs of a specific licensee should be described. The emergency plan should describe only one on-shift and ERO augmentation staffing plan.
- The augmentation times listed are intended to provide a model for applicants and licensees to consider in the development of their site-specific emergency plan.
- The titles of the positions are as defined in the site-specific emergency plan.
- The locations of these positions are intended to provide a model for applicants and licensees to consider in the development of their site-specific emergency plan. Licensees may choose to have these positions, or functions, at other facilities and/or activated at different emergency classification levels (ECLs).
- Many of these functions may be assigned as additional duties, but the licensee is required to support the position that no credible accident scenario(s) can occur which would detract a given position from the performance of its assigned emergency response function(s).
- The development of on-shift and ERO staffing levels should be performance-based, as much as possible, as long as the capabilities of the listed functions are constantly maintained. Once developed, and approved by the NRC, changes to the on-shift and ERO staffing are evaluated and controlled in accordance with 10 CFR 50.54(q).
- The number of operations staff on-shift is controlled by the site-specific Technical Specifications or other licensing documents; however, the normal plant operating organization should be described in sufficient detail to determine if adding emergency response functions to existing operations staff creates situations where competing priorities could preclude timely emergency response action(s).
- The fire brigade is controlled by the site-specific Technical Specifications or other licensing documents; however, the normal plant fire brigade organization should be described in sufficient detail to determine if adding emergency response functions creates situations where competing priorities could preclude timely emergency response action(s).

Emergency Preparedness Function	On Shift	Technical Support Center (TSC)/ Operations Support Center (OSC)		Emergency Operations Facility (EOF)/ Joint Information Center (JIC)/ Joint Information System (JIS)
		Alert or Greater Augment w/in 60-min[1, 2]	Alert or Greater Augment w/in 90-min[1, 2]	Site Area Emergency (SAE) or Greater Augment w/in 60-min[3]
Command & Control • Provide overall ERO command and control until relieved. • Approve emergency action level (EAL) and/or PAR classifications until relieved. • Authorize personnel dose extensions until relieved.	Operations Shift Manager	Emergency Coordinator (1)	Not applicable	Emergency Director (1)
Communications • Communicate EAL and PAR classifications to offsite agencies, including the NRC, until relieved.	Communicator[1]	Communicators (TSC) (2) *One communicator for the NRC and one communicator for offsite response agencies.*	As needed. *One communicator staffed for NRC communications if needed.*	Communicator (1)
Radiation Protection • Provide qualified health physics (HP) coverage for responders accessing potentially unknown radiological environments during emergency conditions. • Provide in-plant surveys, onsite surveys, and offsite surveys. • Support offsite field monitoring teams (FMTs)[1]. • Control dosimetry and access control.	HP Personnel[4]	Additional HP Technicians *[In addition to personnel on-shift]* (OSC) (3)	Additional HP Technicians *[In addition to personnel on-shift and those responding within 60-minutes]* (OSC) (3)	Not applicable

Emergency Preparedness Function	On Shift	Technical Support Center (TSC)/ Operations Support Center (OSC)		Emergency Operations Facility (EOF)/ Joint Information Center (JIC)/ Joint Information System (JIS)
		Alert or Greater Augment w/in 60-min[1, 2]	Alert or Greater Augment w/in 90-min[1, 2]	Site Area Emergency (SAE) or Greater Augment w/in 60-min[3]
Supervision of Radiation Protection • Evaluate and assess plant and offsite radiological data in the development of onsite protective actions and offsite PARs, until relieved. • Recommend onsite and offsite PARs to the applicable decision-maker, until relieved. • Direct all radiation protection activities, including field team direction, until relieved. • Provide relevant information to applicable communicators who are communicating offsite protective actions to offsite agencies, until relieved.	Operations Shift Manager	Site Radiation Protection Coordinator (SRPC) (1) (TSC)	Not applicable	Radiation Protection Manager (1) (EOF)
Dose Assessments/ Projections • Perform dose assessments/ projections and provide input to applicable PAR decision-maker, until relieved.	Dose Assessment/ Projection Staff [1]	Dose Assessment/ Projection Staff (1) (TSC)	Not applicable	Dose Assessment/ Projection Staff (1) (EOF)

Emergency Preparedness Function	On Shift	Technical Support Center (TSC)/ Operations Support Center (OSC)		Emergency Operations Facility (EOF)/ Joint Information Center (JIC)/ Joint Information System (JIS)
		Alert or Greater Augment w/in 60-min[1, 2]	Alert or Greater Augment w/in 90-min[1, 2]	Site Area Emergency (SAE) or Greater Augment w/in 60-min[3]
Emergency Classifications • Evaluate plant conditions and recommend emergency classifications, until relieved.	Emergency Classification Advisor[1]	Emergency Classification Advisor (1) (TSC) *Licensees should consider having a liaison between Operations (Control Room) and the TSC to perform this function.*	Not applicable	Not applicable
Engineering • Provide engineering coverage related to the specific discipline of the assigned engineer, until relieved	**Core/Thermal Hydraulics Engineer**[1] • Evaluate reactor conditions.	**TSC Engineering Staff** • (1) Electrical/ Instrumentation and Control (I&C): Provide engineering coverage for the ERO related to electrical or I&C equipment. • (1) Mechanical: Provide engineering coverage for the ERO related to mechanical equipment. • (1) Core/Thermal Hydraulics: Evaluate reactor conditions.	As needed	Not applicable

Emergency Preparedness Function	On Shift	Technical Support Center (TSC)/ Operations Support Center (OSC)		Emergency Operations Facility (EOF)/ Joint Information Center (JIC)/ Joint Information System (JIS)
		Alert or Greater Augment w/in 60-min[1, 2]	Alert or Greater Augment w/in 90-min[1, 2]	Site Area Emergency (SAE) or Greater Augment w/in 60-min[3]
Security	Security staffing is per the site Security Plan.	**Security Supervisor (TSC) (1)** • Coordinate security related activities and information with the Emergency Coordinator.	Not applicable	Not applicable
Repair Team Activities	**Operations Staff** • Limited maintenance capability needed on-shift[5]. This is typically limited to minor electrical and/or mechanical work to restore power and/or emergency core cooling system (ECCS) flow, as well as possibly filling and venting instrumentation lines.	**Maintenance Personnel (OSC) (1 electrician, 1 mechanic)** • (1) Electrician: Provide electrical support for ECCS equipment, event mitigation, and equipment repair. • (1) Mechanic: Provide mechanical support for ECCS equipment, event mitigation, and equipment repair.	**Maintenance Personnel (OSC)** • (1) I&C Technician: Provide assistance with logic manipulation, support for event mitigation and equipment repair, and support of digital I&C if applicable. Additional I&C staff may be called out if needed. • Electricians – As needed. • Mechanics – As needed.	Not applicable

Emergency Preparedness Function	On Shift	Technical Support Center (TSC)/ Operations Support Center (OSC)		Emergency Operations Facility (EOF)/ Joint Information Center (JIC)/ Joint Information System (JIS)
		Alert or Greater Augment w/in 60-min[1, 2]	Alert or Greater Augment w/in 90-min[1, 2]	Site Area Emergency (SAE) or Greater Augment w/in 60-min[3]
Supervision of Repair Team Activities	Repair Team Supervisor[1]	**Lead OSC Supervisor (1)** • Supervise OSC activities as directed by Emergency Coordinator.	**OSC Supervisors** • (1) Electrical: Supervise OSC activities related to electrical equipment. • (1) Mechanical: Supervise OSC activities related to mechanical equipment. • (1) I&C: Supervise OSC activities related to I&C equipment. May be combined with Electrical Supervisor. • (1) HP: Supervise OSC activities related to radiation protection.	Not applicable

Emergency Preparedness Function	On Shift	Technical Support Center (TSC)/ Operations Support Center (OSC)		Emergency Operations Facility (EOF)/ Joint Information Center (JIC)/ Joint Information System (JIS)
		Alert or Greater Augment w/in 60-min[1, 2]	Alert or Greater Augment w/in 90-min[1, 2]	Site Area Emergency (SAE) or Greater Augment w/in 60-min[3]
FMTs	Not applicable	**Onsite FMT** • (1) Radiation Monitor to assess environmental radiation/ contamination and provide input to the SRPC. Also provide HP coverage for team. • (1) Driver to provide transportation, if applicable. **Offsite FMT A** • (1) Qualified individual to perform environmental radiation/ contamination assessments and radioactive plume tracking. Communicate and coordinate with applicable ERO supervision. Responsible for the radiation protection of the field team. • (1) Driver to provide transportation, if applicable.	**Offsite FMT B** • (1) Qualified individual to perform environmental radiation/ contamination assessments and radioactive plume tracking. Communicate and coordinate with applicable ERO supervision. Responsible for the radiation protection of the field team. • (1) Driver to provide transportation, if applicable.	Not applicable

Emergency Preparedness Function	On Shift	Technical Support Center (TSC)/ Operations Support Center (OSC)		Emergency Operations Facility (EOF)/ Joint Information Center (JIC)/ Joint Information System (JIS)
		Alert or Greater Augment w/in 60-min[1, 2]	Alert or Greater Augment w/in 90-min[1, 2]	Site Area Emergency (SAE) or Greater Augment w/in 60-min[3]
Media Information • Manage and coordinate media information related to the event.	Not applicable	JIC/JIS staff to address media inquiries[6]	Not applicable	Staff to perform JIC/JIS-related tasks.
Information Technology (IT) • If emergency plan functions rely on computer-based equipment, provide IT support.	Not applicable	Not applicable	**IT Lead (TSC) (1)**[1] • Qualified individual to ensure IT equipment is operable.	**IT Lead (EOF/JIC/JIS) (1)**[1] • Qualified individual to ensure IT equipment is operable.

[1] Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time. A 10 CFR Part 50, Appendix E shift staffing evaluation must be performed to support assignment of multiple roles to individual responders on-shift. For augmented ERO positions, a similar approach is acceptable for evaluating whether personnel can adequately perform multiple functions without having competing priorities.

[2] Specified TSC/OSC personnel should be capable of performing their required functions within 60(90)-minutes of an Alert or higher EAL classification.

[3] Specified EOF/JIC/JIS personnel should be capable of performing their required functions within 60-minutes of a SAE or higher EAL classification.

[4] Two qualified HP personnel for a single unit site or one per unit for a multi-unit site.

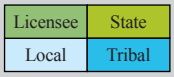
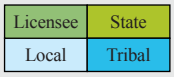
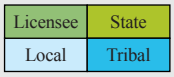
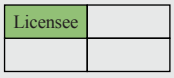
[5] The ability to get ECCS equipment operational is the primary need while on-shift.

[6] May not be performed in the TSC/OSC, but needs to be established at this point.

C: EMERGENCY RESPONSE SUPPORT AND RESOURCES

Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's EOF have been made, and other organizations capable of augmenting the planned response have been identified.

Regulatory References: 10 CFR 50.47(b)(3); 44 CFR 350.5(a)(3)

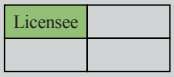
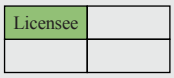
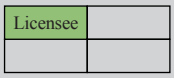
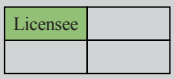
Number & Applicability	Evaluation Criteria
C.1 	Organizations provide emergency response support and resources, as agreed upon, to the licensee's EOF.
C.2 	Provisions are made for additional assistance and resources relied upon in an emergency, to include the following:
C.2.a 	The individual(s), by title/position, authorized to request assistance and resources from responding organizations.
C.2.b 	(1) Each organization from which assistance and resources may be requested, (2) the circumstance(s) in which the support would be required, (3) the process for obtaining needed assistance and resources, (4) each resource or capability expected to be provided, (5) when the expected assistance and resources would be available once requested, and (6) how integration would occur.
C.2.c 	Coordination of site access for external organizations that have agreed to provide requested assistance and resources.
C.2.d 	Provisions to ensure coordination of ORO support onsite with the licensee.
C.2.e 	Agreements are established with local agencies for various situations that may arise. These situations may require police, medical, ambulance, fire, and/or hospital support.
C.3 	The capability of each organization to coordinate with other principal organizations participating in the emergency response is described.
C.4 	Radiological laboratories, their general capabilities, and expected availability to provide radiological monitoring and analysis services that can be used in an emergency are identified. Provisions to augment the identified radiological laboratories are described.

Number & Applicability	Evaluation Criteria
C.5 Licensee	Arrangements are described for integrating the licensee's response with the NRC Headquarters and regional incident response centers and, when dispatched, the NRC's site response team.
C.5.a Licensee	Provisions for activating the NRC's Emergency Response Data System (ERDS) during an emergency are described.
C.5.b Licensee	Provisions to continuously maintain open communications lines with the NRC, when requested, are described.

D: EMERGENCY CLASSIFICATION SYSTEM

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

Regulatory References: 10 CFR 50.47(b)(4); 44 CFR 350.5(a)(4); 10 CFR Part 50, Appendix E, Sec. IV.B and C

Number & Applicability	Evaluation Criteria
D.1 	A standard emergency classification and action level scheme is established and maintained. The scheme provides detailed EALs for each of the four ECLs in Section IV.C.1 of Appendix E to 10 CFR Part 50.
D.1.a 	The EALs are developed using guidance provided or endorsed by the NRC as applicable to the reactor design.
D.1.b 	The initial emergency classification and action level scheme is discussed and agreed to by the licensee and OROs. Thereafter, the scheme is reviewed with OROs on an annual basis.
D.2 	The capability to assess, classify, and declare the emergency condition within 15 minutes after the availability of indications to plant operators that an EAL has been met or exceeded is described.
D.3 	Procedures include immediate actions to be taken which are consistent with the ECL declared by the licensee.
D.4 	Procedures include implementing immediate actions based on the ECL declared by the licensee and applicable offsite conditions.

E: NOTIFICATION METHODS AND PROCEDURES

Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.

Regulatory References: 10 CFR 50.47(b)(5); 44 CFR 350.5(a)(5)

Number & Applicability	Evaluation Criteria
E.1 Licensee / State / Local / Tribal	The mutually agreeable bases for direct and prompt notification of response organizations for emergency declarations are described.
E.1.a Licensee / State / Local / Tribal	Provisions for notification of response organizations are established, including the means for verification of messages.
E.2 Licensee / State / Local / Tribal	The means for alerting, notifying, and mobilizing emergency response personnel are described.
E.3 Licensee / State / Local / Tribal	The licensee, in conjunction with state, local, and tribal organizations, establishes the contents of the initial and follow-up emergency notifications to be sent from the NPP.
E.4 State / Local / Tribal	Each organization establishes the contents of the initial and follow-up messages to the public including, as applicable, instructions for protective actions.
E.5 Licensee / State / Local / Tribal	Provisions are made to provide supplemental information periodically throughout the incident to inform the public.
E.6 Licensee / State / Local / Tribal	The administrative means and the time required for alerting, notifying, and providing prompt instructions to the public within the plume exposure pathway EPZ are established. The organizations or titles/positions responsible for activating the system are identified.

F: EMERGENCY COMMUNICATIONS

Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

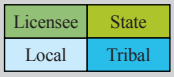
Regulatory References: 10 CFR 50.47(b)(6); 44 CFR 350.5(a)(6)

Number & Applicability	Evaluation Criteria
F.1 	Each principal response organization establishes redundant means of communication and addresses the following provisions:
F.1.a 	Continuous capability for notification to, and activation of, the emergency response network, including a minimum of two independent communication links.
F.1.b 	Communication with applicable organizations to include a description of the methods that may be used when contacting each organization.
F.1.c 	Systems for alerting or activating emergency personnel in each response organization.
F.2 	The systems used to alert and notify the general public within the plume exposure pathway EPZ and methods of activation are described.
F.3 	Systems for coordinated communication methods for applicable fixed and mobile medical support facilities are described.
F.4 	The testing method and periodicity for each communication system used for the functions identified in Evaluation Criteria F.1, F.2, and F.3 are described.

G: PUBLIC EDUCATION AND INFORMATION

Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

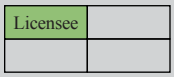
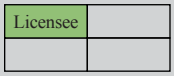
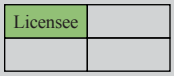
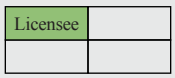
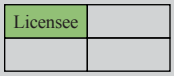
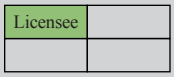
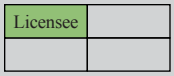
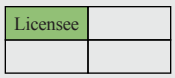
Regulatory References: 10 CFR 50.47(b)(7); 44 CFR 350.5(a)(7)

Number & Applicability	Evaluation Criteria
G.1 	Provisions are made for a coordinated annual dissemination of information to the public, including transient populations and those with disabilities and access/functional needs, regarding how they will be notified and what their actions should be in an emergency. The information is disseminated using multiple methods, to include non-English translations per current Federal guidance.
G.2 	Methods, consistent with JIS concepts, are established for coordinating and disseminating information to the public and media. Plans include the physical location(s) for interacting with the media.
G.3 	Organizations designate news media points of contact and a spokesperson(s) with access to necessary information.
G.3.a 	Arrangements are made for the timely exchange of information among the designated spokespersons representing the entities involved in incident response.
G.4 	Organizations establish coordinated arrangements for identifying and addressing public inquiries and inaccurate information.
G.5 	Organizations coordinate programs to acquaint news media with the emergency plans at least annually.

H: EMERGENCY FACILITIES AND EQUIPMENT

Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

Regulatory References: 10 CFR 50.47(b)(8); 44 CFR 350.5(a)(8)

Number & Applicability	Evaluation Criteria
H.1 	A TSC is established from which plant conditions are evaluated and corrective actions are developed to mitigate accident conditions.
H.2 	An OSC is established from which repair team activities are planned and teams are dispatched to implement corrective actions developed by the TSC.
H.3 	An EOF is established from which evaluation and coordination of licensee activities related to an emergency are to be carried out and from which the licensee can provide information to Federal, state, local, and tribal authorities responding to a radiological emergency.
H.3.a 	For an EOF that is located more than 25 miles away from the NPP, provisions are made for locating NRC and offsite responders closer to the NPP.
H.4 	An alternative facility (or facilities) is established that would be accessible even if the site is under threat of or experiencing hostile action.
H.5 	A JIC is established to coordinate communication from Federal, state, local, and tribal authorities with the public and media. The location of the JIC has the same requirements as the location of the EOF (i.e., within 25 miles of the plant). If the JIC is located at a consolidated EOF that is located more than 25 miles from the site, then a facility is provided within 25 miles of the site, which is agreed upon by state, local, and tribal stakeholders, to provide information to the public and media.
H.6 	Each organization establishes an emergency operations center (EOC) for use in directing and controlling response functions. For an EOC located within the plume exposure pathway EPZ, an alternate EOC or location outside the plume exposure pathway EPZ is identified to continue response functions in the event of an evacuation.
H.7 	Onsite monitoring systems used to initiate emergency measures in accordance with the emergency classification scheme, as well as those to be used for conducting assessment, are identified. Monitoring systems consist of:
H.7.a 	Geophysical phenomena monitors, including meteorological, hydrologic, and seismic instrumentation.

Number & Applicability	Evaluation Criteria
H.7.b Licensee	Radiological monitors, including process, area, emergency, effluent, and portable monitors, and sampling equipment.
H.7.c Licensee	Process monitors, including reactor coolant system pressure and temperature, containment pressure and temperature, liquid levels, flow rates, and status or lineup of equipment components.
H.7.d Licensee	Fire and combustion products detectors.
H.8 Licensee	Provisions are made to acquire data from, or for emergency access to, offsite monitoring and analysis equipment, including:
H.8.a Licensee	Geophysical phenomena monitors, including meteorological, hydrologic, and seismic instrumentation.
H.8.b Licensee	Radiological monitors, including ratemeters, sampling devices, and environmental dosimeters.
H.8.c Licensee	Laboratory facilities, fixed or mobile.
H.9 Licensee, State, Local, Tribal	Organizations directly responsible for offsite radiological monitoring, provide for radiological monitoring equipment in the vicinity of the nuclear facility.
H.10 Licensee	Instrumentation is provided to obtain current meteorological information and additional provisions are made to get representative meteorological information from other sources. Monitoring systems provide the following information:
H.10.a Licensee	Site meteorological information to the control room, TSC, EOF, and NRC (via ERDS).
H.10.b Licensee	Meteorological instrumentation inputs needed by the facility's emergency radiological assessment models for site-specific characterization of plume dispersion and transport.

Number & Applicability	Evaluation Criteria
H.11 Licensee: ✓ State: ✓ Local: ✓ Tribal: ✓	Each organization makes provisions to inspect, inventory, and operationally check emergency equipment/instruments at least once each calendar quarter. This includes:
H.11.a Licensee: ✓ State: ✓ Local: ✓ Tribal: ✓	Provisions to operationally check emergency equipment/instruments prior to each use.
H.11.b Licensee: ✓ State: ✓ Local: ✓ Tribal: ✓	Sufficient reserves of equipment/instruments to replace those which are removed from emergency kits for calibration or repair.
H.11.c Licensee: ✓ State: ✓ Local: ✓ Tribal: ✓	Calibrating equipment at intervals recommended by the supplier of the equipment/ instruments.
H.11.d Licensee: ✓ State: ✓ Local: ✓ Tribal: ✓	Identifying the organization(s) responsible for the maintenance and storage of radiological equipment/instruments.
H.12 Licensee: ✓ State: ✓ Local: ✓ Tribal: ✓	Emergency kits are identified by general category. Contents and quantity of each emergency kit are specified in the emergency plan or other document(s) referenced in the emergency plan.
H.13 Licensee: ✓ State: ✓ Local: ✓ Tribal: ✓	Each organization establishes a central point for the receipt and analysis of field monitoring data and coordination of sample media, and identifies the organization(s) responsible for assessing radiological data.

I: ACCIDENT ASSESSMENT

Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

Regulatory References: 10 CFR 50.47(b)(9); 44 CFR 350.5(a)(9)

Number & Applicability	Evaluation Criteria
I.1 Licensee	Capabilities for performing radiological assessment for each reactor on the site, individually and collectively, including response to events occurring simultaneously at all units on the site, are described. These capabilities include:
I.1.a Licensee	A methodology for determining the magnitude and isotopic composition of potential or ongoing releases of radioactive material through waterborne or airborne release pathways.
I.1.b Licensee	A radiological assessment model for airborne releases that provides realistic estimates of onsite and offsite radiation exposures and contamination levels using a dispersion model that is representative of the plant release point configuration, topographical features, and meteorological regimes at the plant site.
I.1.c Licensee	A methodology for assessing contamination of drinking water by waterborne releases for sites located on bodies of water from which public drinking water is drawn.
I.1.d Licensee	A capability to coordinate and implement in-field radiological assessments by field monitoring and/or sampling teams and to assess the data obtained.
I.2 Licensee	The capability and responsibility for continually assessing the following parameters, that provide input to radiological assessments during an emergency, are described: 1. Fraction of reactor fuel that has been damaged (e.g., clad failure, core melt). 2. Status of containment integrity. 3. Identification of leakage of radioactive material from plant systems, storage tanks, spent fuel pools, and onsite dry fuel storage casks. 4. Status of engineered safety systems to mitigate the release of radioactive material to the environment (e.g., filters, containment spray, etc.). 5. Onset and duration of actual or potential release of radioactive material to the environment.
I.3 Licensee	The methods, techniques, and responsibility for determining the source term present in reactor coolant, containment (including drywell and wet well) air spaces, and fuel storage area air spaces are described.
I.3.a Licensee	The contingency arrangements to obtain and analyze highly radioactive samples from the reactor coolant system, containment, containment (including drywell and wet well) atmosphere, and sump are described.

Number & Applicability	Evaluation Criteria
I.4 Licensee / State Local / Tribal	The organization with the primary responsibility for field monitoring activities, including the necessary resources, is identified.
I.5 Licensee / State Local / Tribal	Each organization, where appropriate, provides methods, equipment, and expertise to make rapid assessments of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways.
I.6 Licensee / State Local / Tribal	The capability to detect and measure radioiodine concentrations in air in the plume exposure pathway EPZ as low as 10^{-7} μCi/cc (microcuries per cubic centimeter) under field conditions is described. The sample collection process takes into account the sample flow rate, collection efficiency of the sample media used to collect the sample, duration of the sample, counter efficiency, and background radiation, including interference from the presence of noble gases.
I.7 Licensee / State / Tribal	A means is established for relating the various measured parameters (e.g., exposure rates, contamination levels, and air activity levels) to dose or dose rates. Provisions are made for estimating integrated dose from the projected and actual dose rates and for comparing these estimates with current Federal guidance. In addition, provisions are established to verify dose projections with field data and compare projections with other organizations also calculating dose projections. The detailed provisions are described in separate procedures.
I.8 Licensee / State Local / Tribal	Arrangements to locate and track the airborne radioactive plume are made using available resources, which includes Federal, state, and/or licensee resources. Provisions are made to characterize the plume including taking peak plume measurements. Identification of the plume includes determining a measurement that is high enough to be reasonably above background radiation readings and sufficient enough to indicate submersion within the plume.
I.9 Licensee / State Local / Tribal	Organizations directly responsible for radiological monitoring, analysis, and dose projections describe the capability for coordinating monitoring efforts, tracking and trending data, and sharing analytical results with other organizations performing radiological assessment functions.

J: PROTECTIVE RESPONSE

A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

Regulatory References: 10 CFR 50.47(b)(10); 44 CFR 350.5(a)(10)

Number & Applicability	Evaluation Criteria
J.1 Licensee	The means and time required to alert, notify, and provide a range of protective actions for onsite individuals and individuals who may be in areas controlled by the licensee (including members of the public) during an incident are described.
J.1.a Licensee	Provisions are made for evacuation of onsite non-essential personnel at SAE/GE.
J.2 Licensee, State, Local, Tribal	Provisions are made and coordinated with appropriate offsite entities for evacuation routes and transportation for onsite individuals to a suitable offsite location. Selection of location considers the potential for inclement weather, high traffic density, and potential radiological conditions. Alternate location(s) and route(s) are identified.
J.3 Licensee	Radiological monitoring and decontamination, if necessary, of personnel evacuated from the site are provided.
J.4 Licensee	The capability to account for all individuals inside the plant Protected Area following declaration of a SAE or GE is described. The names of missing individuals are ascertained within 30 minutes following the emergency declaration and accountability is maintained continuously thereafter.
J.5 Licensee	Provisions are made for personal radiological protection for individuals arriving or remaining onsite during the incident.
J.6 Licensee, State, Tribal	The basis and methodology are established for the development of PARs for the responsible OROs, including evacuation, sheltering, and, if appropriate, radioprotective drug use, for the plume exposure pathway EPZ.
J.7 Licensee, State, Local, Tribal	A site-specific protective action strategy, informed by the ETE study, is developed, maintained, and coordinated between the licensee and OROs. Currently accepted and/or endorsed Federal methodologies are used.

Number & Applicability	Evaluation Criteria
J.8 Licensee / State / Local / Tribal	The latest ETEs are incorporated either by reference or in their entirety in the emergency plan.
J.9 Licensee / State / Local / Tribal	PARs are provided directly to the designated ORO(s) responsible for making protective action decisions (PADs) within the plume exposure pathway EPZ.
J.10 State / Local / Tribal	A capability for implementing protective actions based upon current Federal guidance is established. The process ensures coordinated implementation of PADs with all appropriate jurisdictions.
J.11 Licensee / State / Local / Tribal	The process for implementing protective actions for the plume exposure pathway EPZ is described including the following:
J.11.a Licensee / State / Local / Tribal	Maps, charts, or other information showing evacuation routes, evacuation areas, reception centers in host areas, and shelter areas. This includes identifying the organization responsible for updating and maintaining maps, charts, and other information.
J.11.b Licensee / State / Local / Tribal	Maps, tables, or other information showing population distribution around the nuclear facility by evacuation areas.
J.11.c State / Local / Tribal	Means for identifying and protecting access/functional needs groups such as: transportation-dependent residents; those within special facilities or correctional facilities whose mobility may be impaired; or residents who would have difficulty in implementing protective actions without assistance. These means include notification, support, and assistance in implementing protective actions where appropriate.
J.11.d State / Local / Tribal	The decision-making methodologies for use of radioprotective drugs and the provisions for administration to the general public, emergency workers, and institutionalized persons within the plume exposure pathway EPZ. This includes the means of determining quantities, maintaining and managing supplies, communicating recommendations, and distributing.
J.11.e State / Local / Tribal	Means of evacuation are informed by the updated ETEs. The evacuation routes and transportation resources to be utilized are described and include projected traffic capacities of evacuation routes under emergency conditions and implementation of traffic control schemes during evacuation.
J.11.f State / Local / Tribal	The locations of pre-identified reception centers beyond the boundaries of the plume exposure pathway EPZ, organizations responsible for managing reception centers, arrangements for handling service animals and pets, and provisions for radiological monitoring/decontamination.
J.11.g State / Local / Tribal	Means for the initial and ongoing control of access to evacuated areas and organizational responsibilities for such control, including identifying pre-selected control points.

Number & Applicability	Evaluation Criteria
J.11.h State / Local / Tribal	Identification of and means for dealing with potential impediments to the use of evacuation routes (e.g., seasonal impassability of roads) and contingency measures. The resources available to clear impediments and responsibility for re-routing traffic, as necessary, are described.
J.11.i Licensee / State / Local / Tribal	Identification of any pre-planned precautionary actions (e.g., at SAE) and means for implementation.
J.12 State / Tribal	Protective actions to be used for the ingestion exposure pathway EPZ are specified, including the methods for protecting the public from consumption of contaminated foodstuffs.
J.13 State / Local / Tribal	The means for registering, monitoring, and decontaminating evacuees, service animals, pets, vehicles, and possessions at reception centers in host areas are described. The personnel and equipment available are capable of monitoring 20 percent of the plume exposure pathway EPZ population, including transients, assigned to each facility within a 12-hour period.
J.14 State / Local / Tribal	General plans for the removal or continued exclusion of individuals from restricted areas are developed. Relocation plans include:
J.14.a State / Local / Tribal	Process for implementing current Federal guidance for relocation.
J.14.b State / Local / Tribal	Means to identify and determine the boundaries of relocation areas, including a buffer zone.
J.14.c State / Local / Tribal	Prioritization of relocation based on projected dose to an individual and the timeframe for relocation.
J.14.d State / Local / Tribal	Control of access to and egress from relocation areas and security provisions for depopulated areas.
J.14.e State / Local / Tribal	Contamination control during relocation.
J.14.f State / Local / Tribal	Means for coordinating and providing assistance during relocation.

K: RADIOLOGICAL EXPOSURE CONTROL

Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

Regulatory References: 10 CFR 50.47(b)(11); 44 CFR 350.5(a)(11)

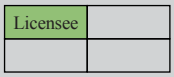
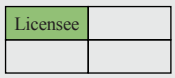
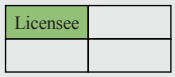
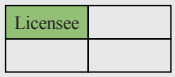
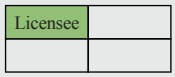
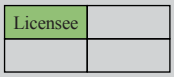
Number & Applicability	Evaluation Criteria
K.1 Licensee	The radiation protection program for emergency workers to be implemented during emergencies is described. This program addresses the following aspects:
K.1.a Licensee	Onsite exposure guidelines, including limits for internal and external radiation contamination, for emergency workers consistent with their assigned duties and current Federal guidance and the conditions under which the emergency controls apply.
K.1.b Licensee	The capability to monitor emergency worker exposures (i.e., total effective dose equivalent [TEDE]) at the time of exposure when direct measurement of the TEDE components is not feasible.
K.1.c Licensee	The capability to continuously monitor and assess the radiation doses received by emergency workers.
K.1.d Licensee	The capability to implement onsite contamination control measures.
K.1.e Licensee	The capability to decontaminate emergency workers, equipment, vehicles, and other material.
K.1.f Licensee	Appropriate radiation protection briefings for (1) repair teams that are being dispatched into the plant, and (2) FMTs being sent onsite and offsite, the scope of which is consistent with the expected risk to the team.
K.1.g Licensee	The process for site access and dosimetry issuance to personnel from OROs arriving to assist with the onsite response.
K.2 Licensee, State, Local, Tribal	Individual(s) that can authorize personnel to receive radiation doses in excess of the occupational dose limits in accordance with the minimum standards set forth in 10 CFR Part 20 or 29 CFR 1910.1096, as applicable to the organization, are identified by title/position. Such authorizations are documented.

Number & Applicability	Evaluation Criteria
K.2.a 	The process for allowing onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities is described.
K.3 	Provisions for the continuous capability to determine the doses received by emergency workers involved in any commercial NPP incident are described. Each organization makes provisions for distribution of direct-reading dosimeters (DRDs) and permanent record dosimeters (PRDs).
K.3.a 	Provisions to ensure that DRDs are read at appropriate intervals and dose records are maintained for emergency workers are described.
K.3.b 	The process for authorizing emergency workers to incur exposures in excess of the current Federal guidance is described.
K.4 	Action levels for determining the need for decontamination are specified and the means for radiological decontamination are established for emergency workers and the general public, as well as equipment, vehicles, and personal possessions. The means for disposal of contaminated waste are also established.

L: MEDICAL AND PUBLIC HEALTH SUPPORT

Arrangements are made for medical services for contaminated injured individuals.

Regulatory References: 10 CFR 50.47(b)(12); 44 CFR 350.5(a)(12)

Number & Applicability	Evaluation Criteria
L.1 	Arrangements are established with primary and backup hospitals (one hospital is located outside the plume exposure pathway EPZ) and medical services. These facilities have the capability for evaluation of radiation exposure and uptake. The persons providing these services are adequately trained and prepared to handle contaminated and/or injured emergency workers and members of the general public.
L.2 	Arrangements for the medical treatment of contaminated injured onsite personnel and those onsite personnel who have received significant radiation exposures and/or significant uptakes of radioactive material are described. These arrangements include the following components:
L.2.a 	A continuous, onsite first aid capability with adequate medical equipment and supplies available onsite to perform this capability.
L.2.b 	Primary and backup offsite medical facilities to treat contaminated, injured personnel on a continuous basis.
L.2.c 	Radiological controls capability, including the isolation of contamination, assessment of contamination levels, radiation exposure monitoring for medical facility staff, collection of contaminated waste, and decontamination of treatment areas.
L.2.d 	Provisions are made for the evaluation of injured personnel for radiological contamination prior to transport to a medical facility.
L.3 	The capability for the treatment of radiation sickness due to exposure to radioactive material is described.
L.4 	Supplemental lists are developed that indicate the location of the closest public, private, and military hospitals and other emergency medical facilities within the state or contiguous states considered capable of providing medical support for any contaminated individual.
L.5 	Each organization arranges for the means to control contamination while transporting victims of radiological accidents to medical support facilities and the decontamination of transport vehicle following use.

M: RECOVERY, REENTRY, AND POST-ACCIDENT OPERATIONS

General plans for recovery and reentry are developed.

Regulatory References: 10 CFR 50.47(b)(13); 44 CFR 350.5(a)(13)

Number & Applicability	Evaluation Criteria
M.1 Licensee, State, Local, Tribal	General recovery, reentry, and return plans and procedures are developed, as appropriate.
M.2 Licensee	Individuals that will comprise the facility's recovery organization are identified by title/ position. The recovery organization includes technical personnel with responsibilities to develop, evaluate, and direct recovery and reentry operations.
M.3 Licensee, State, Local, Tribal	The process for initiating recovery actions is described and includes the criteria for terminating the emergency. Provisions ensure continuity during transfer of responsibility from the emergency phase to the recovery phase and that a chain of command is established.
M.4 Licensee	Provisions for allowing reentry into the owner controlled area (OCA) are described. Reentry planning includes evaluation of the controls necessary for reentry under post-incident conditions.
M.5 State, Local, Tribal	Provisions for reentry into restricted areas, including exposure and contamination control, are addressed as appropriate. A method for coordinating and implementing decisions regarding temporary reentry into restricted areas is addressed.
M.6 State, Local, Tribal	The criteria for relaxing protective actions and allowing for return are described. Prioritization is given to restoring access to vital services and facilities.
M.7 State, Local, Tribal	The organization(s) responsible for developing and implementing cleanup operations is identified.
M.8 Licensee, State, Local, Tribal	Provisions for developing and modifying sampling plans are established. Provisions for laboratory analysis of samples are included in the plan.

N: EXERCISES AND DRILLS

Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

Regulatory References: 10 CFR 50.47(b)(14); 44 CFR 350.5(a)(14)

Number & Applicability	Evaluation Criteria
N.1 Licensee / State / Local / Tribal	Exercises and drills are conducted, observed, and critiqued/evaluated as set forth in NRC and FEMA regulations and guidance.
N.1.a Licensee / State / Local / Tribal	The process to critique/evaluate exercises and drills is described.
N.1.b Licensee / State / Local / Tribal	Responsibility for implementing corrective actions is assigned. Organizations that are assigned responsibility establish means to ensure that corrective actions are implemented.
N.1.c Licensee	A drill or exercise starts between 6:00 p.m. and 4:00 a.m. at least once every eight-year exercise cycle.
N.1.d Licensee	At least one drill or exercise in every eight-year exercise cycle is unannounced.
N.2 Licensee / State / Local / Tribal	Exercises are designed to enable the response organizations' demonstration of the key skills necessary to implement the principal functional areas of emergency response. The following two types of exercises are conducted at the frequency noted:
N.2.a Licensee / State / Local / Tribal	Exercises that include mobilization of licensee, state, local, and tribal (as appropriate) personnel and resources and implementation of emergency plans to demonstrate response capabilities within the plume exposure pathway EPZ to a NPP incident are conducted biennially.
N.2.b State / Local / Tribal	Exercises that include mobilization of state, local, and tribal (as appropriate) personnel and resources and implementation of emergency plans to demonstrate response capabilities to a release of radioactive materials requiring post-plume phase protective actions beyond the plume exposure pathway EPZ are conducted during each eight-year exercise cycle.
N.3 Licensee / State / Local / Tribal	Exercise scenario content is varied to provide the opportunity to demonstrate the key skills necessary to respond to the following scenario elements during each eight-year exercise cycle:

Number & Applicability	Evaluation Criteria
N.3.a Licensee / State / Local / Tribal	**Hostile Action-Based (HAB)**. Hostile action directed at the plant site. The HAB exercise scenario may be combined with either a radiological release scenario or no/minimal radiological release scenario, but a no/minimal radiological release scenario should not be included in consecutive HAB exercises at a NPP site.
N.3.b Licensee / State / Local / Tribal	**Rapid Escalation**. An initial classification of, or rapid escalation to, a SAE or GE.
N.3.c Licensee / State / Local / Tribal	**No/Minimal Release of Radioactive Materials**. No release or an unplanned minimal release of radioactive material which does not require public protective actions.
N.3.c.1 Licensee / State / Local / Tribal	The licensee is required to demonstrate the ability to respond to a no/minimal radiological release scenario at least once within the eight-year exercise cycle. State, local, and tribal response organizations have the option, and are encouraged, to participate jointly in this demonstration.
N.3.c.2 Licensee / State / Local / Tribal	When planning for a joint no/minimal radiological release exercise, affected state, local, and tribal jurisdictions, the licensee, and FEMA will identify offsite capabilities that may still need to be evaluated and agree upon appropriate alternative evaluation methods to satisfy FEMA's biennial criteria requirements. Alternative evaluation methods that could be considered during the extent of play negotiations include expansion of the exercise scenario, out of sequence activities, plan reviews, staff assistance visits or other means as described in FEMA guidance.
N.3.c.3 Licensee / State / Local / Tribal	If the offsite organizations elect not to participate in the licensee required minimal or no-release exercise, they will still be obligated to meet the exercise requirements as specified in 44 CFR 350.9.
N.3.d Licensee	**10 CFR 50.54(hh)(2) Strategies**. Demonstration of the use of equipment, procedures, and strategies developed in compliance with 10 CFR 50.54(hh)(2).
N.3.e Licensee / State / Local / Tribal	**Resource Integration**. Integration of offsite resources with onsite response.
N.4 Licensee / State / Local / Tribal	Drills are designed to enable an organization's demonstration and maintenance of key skills necessary to fulfill functional roles. Drills include, but are not limited to, the following at their noted frequencies:
N.4.a Licensee	**Emergency Medical Drills**. An emergency medical drill involving a simulated contaminated individual and contains provisions for participation by support services agencies (i.e., ambulance and offsite medical treatment facility) is conducted annually.

Number & Applicability	Evaluation Criteria
N.4.b State / Local / Tribal	**Medical Services Drills**. An emergency medical drill involving a simulated contaminated emergency worker and/or member of the general public and contains provisions for participation by support services agencies (i.e., ambulance and offsite medical treatment facility) is conducted annually.
N.4.c State / Local / Tribal	**Laboratory Drills**. A laboratory drill is conducted biennially that involves demonstration of handling, documenting, and analyzing air, soil, and food samples as well as quality control and quality assurance processes. This drill also involves an assessment of the laboratory's capacity to handle daily and weekly samples and the volume of samples that can be processed daily or weekly.
N.4.d Licensee / State / Local / Tribal	**Environmental Monitoring Drills**. Environmental monitoring drills are conducted annually. These drills include direct radiation measurements in the environment, collection and analysis of all sample media (e.g., water, vegetation, soil, and air), and provisions for communications and record keeping.
N.4.e State / Local / Tribal	**Ingestion Pathway Drills**. An ingestion pathway drill is conducted biennially that involves sample plan development, analysis of lab results from samples, assessment of the impact on food and agricultural products, protective decisions for relocation, and food/crop embargo.
N.4.f Licensee	**Post-Accident Sampling Drills**. Post-accident sampling capabilities including analysis of in-plant liquid samples with simulated or actual elevated radiation levels are to be demonstrated annually.
N.4.g Licensee	**Off-Hours Report-In Drills**. Off-hours report-in drills are unannounced and conducted at least biennially.
N.4.h Licensee	**Off-Hours Call-In Drills**. Off-hours call-in drills are conducted at least quarterly, such that each ERO member's response time is validated at least biennially. Some drills are unannounced.
N.4.i Licensee	**Onsite Personnel Protective Action Drills**. Protective actions drills are conducted during every eight-year exercise cycle to demonstrate the site's ability to implement and coordinate protective actions for onsite personnel during hostile action.
N.4.j Licensee	**Aircraft Threat/Attack Response Drills**. Drills are conducted during every eight-year exercise cycle to demonstrate the use of procedures and protective measures developed per 10 CFR 50.54(hh)(1) for responding to hostile action involving an aircraft threat or attack.

O: RADIOLOGICAL EMERGENCY RESPONSE TRAINING

Radiological emergency response training is provided to those who may be called on to assist in an emergency.

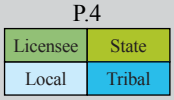
Regulatory References: 10 CFR 50.47(b)(15); 44 CFR 350.5(a)(15)

Number & Applicability	Evaluation Criteria
O.1 Licensee, State, Local, Tribal	Each organization ensures the training of emergency responders and other appropriate individuals with an operational role described in the emergency plan. Initial training and annual retraining are provided.
O.1.a Licensee	Site-specific emergency response training is provided for those offsite organizations that may be called upon to provide onsite assistance in the event of an emergency.
O.2 Licensee	The ERO training program consists of desired learning objectives to develop and maintain key skills. This includes a systematic analysis of jobs and tasks to be performed from which learning objectives are derived.
O.2.a Licensee	The ERO training program is reviewed at least annually and revised as necessary.

P: RESPONSIBILITY FOR THE PLANNING EFFORT: DEVELOPMENT, PERIODIC REVIEW, AND DISTRIBUTION OF EMERGENCY PLANS

Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

Regulatory References: 10 CFR 50.47(b)(16); 44 CFR 350.5(a)(16)

Number & Applicability	Evaluation Criteria
P.1 	The initial training and periodic retraining program of individuals responsible for the planning effort is described.
P.2 	The individual with the overall authority and responsibility for radiological emergency response planning is identified by title/position.
P.3 	The individual with the responsibility for the development, maintenance, review, and updating of emergency plans, as well as the coordination of these plans with other response organizations, is identified by title/position.
P.4 	The program for reviewing annually, and updating as necessary, the emergency plan, implementing procedures, and agreements is described. The program includes a method for recording changes made to the documents and, when appropriate, how those changes are retained.
P.5 	Provisions for distributing the emergency plan and implementing procedures to all organizations and appropriate individuals with responsibility for implementation of the plan/ procedures are described.
P.6 	A listing of annexes, appendices, and supporting plans and their source is included in the emergency plan.
P.7 	An appendix containing a listing by title of the procedures required to maintain and implement the emergency plan is included. The listing includes the section(s) of the emergency plan to be implemented by each procedure.
P.8 	A table of contents and a cross-reference index to each of the NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria are included. The evaluation criteria which do not apply are identified.

Number & Applicability	Evaluation Criteria
P.9 Licensee	The program for conducting independent reviews performed on all emergency preparedness program elements, including a review of the adequacy of interfaces with OROs, is described.
P.10 Licensee / State / Local / Tribal	The process for reviewing and updating contact information identified in the emergency plan and implementing procedures is described and implemented quarterly.
P.11 Licensee	The process for tracking and addressing emergency preparedness program-related issues that could reduce the effectiveness of the emergency plan into the site-wide corrective action program for evaluation, tracking, and correction is described.
P.12 Licensee	The process for how changes, both temporary and permanent, in plant configuration are evaluated for their impact on the effectiveness of the emergency plan is described.

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SECTION III: Resources

AUTHORITIES AND REFERENCES

FEMA-Specific Legislative Authorities

- NRC Authorization Acts of 1980 (Public Law 96-295) and 1982-1983 (Public Law 97-415).
- Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, Titles II and VI, Sections 201 and 611, 42 U.S.C. §§ 5131 and 5196.
- Homeland Security Act of 2002, as amended, Title VI, Chapter 1, Subchapter V, Sections 503 and 504, 6 U.S.C. §§ 313 and 314.
- Security and Accountability for Every Port Act of 2006, Title V, Section 612, 6 U.S.C. § 314a.
- Department of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations for 1999, 42 U.S.C. § 5196e.
- Post-Katrina Emergency Management Reform Act of 2006, Title VI, Section 602, 642, 643, and 644, 6 U.S.C. §§ 701, 742, 743, and 744 (PKEMRA).
- Reorganization Plan No. 3 of 1978.

NRC-Specific Legislative Authorities

- Atomic Energy Act of 1954, as amended (Public Law 83-703).
- Energy Reorganization Act of 1974, as amended (Public Law 93-438).
- Reorganization Plan No. 1 of 1980.
- Energy Policy Act of 2005 (Public Law 109-58).
- NRC Authorization Acts of 1980 (Public Law 96-295), 1982-1983 (Public Law 97-415), and 1984-1985 (Public Law 98-553).

Executive Orders/Presidential Directives and Documents

- Executive Order 12241, as amended.
- Executive Order 12127, as amended.
- Executive Order 12148, as amended.
- Executive Order 12657, as amended.
- Executive Order 13175.
- Homeland Security Presidential Directive 5, "Management of Domestic Incidents" (HSPD-5).
- Presidential Policy Directive 8, "National Preparedness" (PPD-8).
- Presidential Statement, December 7, 1979.
- Tribal Consultation Memorandum of November 5, 2009 (74 FR 57881, November 9, 2009).

Code of Federal Regulations (CFR)

- NRC's regulations in Title 10, Chapter I, Parts 20, 50 and 52 of the CFR.
- FEMA's regulations in Title 44, Chapter I, Parts 350-354 of the CFR.

- 10 CFR 61.71, "State and Tribal government consultation."
- 10 CFR 73.54, "Protection of digital computer and communication systems and networks."

NRC Documents

- Management Directive 8.4, "Management of Facility-specific Backfitting and Information Collection," October 9, 2013, ADAMS Accession No. ML12059A460.
- NUREG-0396, EPA 520/1-78-016, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," December 1978, ADAMS Accession No. ML051390356.
- NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Chapter 13.3, "Emergency Planning," Revision 3, March 2007, ADAMS Accession No. ML063410307.
- NUREG-1150, "Severe Accident Risks: An Assessment for Five U. S. Nuclear Power Plants," 1990, ML040140729 (Vol 1, 2, 3 and Appendices).
- NUREG-1409, "Backfitting Guidelines," July 1990, ADAMS Accession No. ML032230247.
- NUREG-1935, "State-of-the-Art Reactor Consequence Analyses (SOARCA) Report," 2012, ADAMS Accession No. ML12332A057, ML12332A058.
- NUREG-1953, "Confirmatory Thermal-Hydraulic Analysis to Support Specific Success Criteria in the Standardized Plant Analysis Risk Models – Surry and Peach Bottom," May 2011, ADAMS Accession No. ML11256A023.
- NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies," Revision 0, November 2011, ADAMS Accession No. ML11329A053.
- NUREG/CR-7160, "Emergency Preparedness Significance Quantification Process: Proof of Concept," 2012, ADAMS Accession No. ML13164A285.
- NUREG/CR-7177, "Compendium of Analyses to Investigate Select Level 1 Probabilistic Risk Assessment End-State Definition and Success Criteria Modeling Issues," May 2014, ADAMS Accession No. ML14148A126.
- Regulatory Guide 1.101, "Emergency Response Planning and Preparedness for Nuclear Power Reactors," Various Revisions, ADAMS Accession No. ML003740302 (Revision 3), ML032020276 (Revision 4), ML050730286 (Revision 5).
- Regulatory Guide 1.219, "Guidance on Making Changes to Emergency Response Plans for Nuclear Power Reactors," Revision 0, November 2011, ADAMS Accession No. ML102790357.
- SECY-03-0165, "Evaluation of Nuclear Power Reactor Emergency Preparedness Planning Basis Adequacy in the Post-9/11 Threat Environment," September 22, 2003, ADAMS Accession No. ML039160020 (not publicly available).
- SECY-06-0200, "Results of the Review of Emergency Preparedness Regulations and Guidance," September 20, 2006, ADAMS Accession No. ML061910707.
- SECY-08-0024, "Delegation of Commission Authority to Staff to Approve or Deny Emergency Plan Changes That Represent a Decrease in Effectiveness," February 25, 2008, ADAMS Accession No. ML072900547.
- Staff Requirements – SECY-08-0024, "Delegation of Commission Authority to Staff to Approve or Deny Emergency Plan Changes That Represent a Decrease in Effectiveness," May 19, 2008, ADAMS Accession No. ML081400510.

- NUREG-75/014, "Reactor Safety Study—An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants," (WASH-1400), October 1975, ADAMS Accession No. ML070610293 (App III, IV), ML070530533 (App V), ML070600389 (App VI), ML070600376 (App VII-X).
- SECY-12-0095, "Tier 3 Program Plans and 6-Month Update in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Subsequent Tsunami," July 13, 2012, ADAMS Accession No. ML12208A208 (redacted).
- "Planning Basis for Emergency Responses to Nuclear Power Plant Accidents," (44 FR 61123, October 23, 1979).
- Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1), CLI-87-12, 26 NRC 383 (1987), ADAMS Accession No. ML051670650 (no publicly available).
- NRC EP Manual, NUREG-TBD.

DHS/FEMA Documents

- FEMA REP Program Manual, June 2013.
- FEMA-REP-10, "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants," Washington D.C., November 1985.
- FEMA Tribal Policy, June 29, 2010.
- Comprehensive Preparedness Guide (CPG) 101, "Developing and Maintaining Emergency Operations Plans," Version 2.0, November 2010.
- Comprehensive Preparedness Guide (CPG) 201, "Threat and Hazard Identification and Risk Assessment Guide," Second Edition, August 2013.
- National Incident Management System (NIMS), December 2008.
- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.
- National Response Framework (NRF), second edition, May 2013.
- National Response Framework (NRF), Emergency Support Function (ESF) #15 – External Affairs Annex, January 2013.
- National Response Framework (NRF), Public Affairs Support Annex, January 2013.
- National Response Framework (NRF), Nuclear/Radiological Incident Annex (NRIA) June 2008.
- National Response Framework (NRF), Mass Evacuation Incident Annex, June 2008.
- National Disaster Recovery Framework (NDRF), September 2011.

Joint NRC/FEMA Documents

- NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Washington D.C., November 1980, ADAMS Accession No. ML040420012.
- NUREG-0654/FEMA-REP-1, Rev.1, Supplement 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for Utility Offsite Planning and Preparedness," Final Report, Washington D.C., September 1988, ADAMS Accession No. ML083180169.
- NUREG-0654/FEMA-REP-1, Rev.1, Supplement 2, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for Emergency Planning in an Early Site Permit Application," Draft Report for Comment, Washington D.C., Draft, April 1996, ADAMS Accession No. ML050130188.

- NUREG-0654/FEMA-REP-1, Rev.1, Supplement 3, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Guidance for Protective Action Strategies," Washington D.C., October 2011, ADAMS Accession No. ML113010596.
- NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Addenda, Washington D.C., March 2002, ADAMS Accession No. ML021050240.
- NUREG-0654/FEMA-REP-1, Rev.1, Supplement 4, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for National Preparedness Initiative Integration, Exercise Enhancement, and Backup Alert and Notification Systems," October 2011.
- FEMA/NRC Memorandum of Understanding (MOU), June 17, 1993 (58 FR 47997, September 14, 1993), ADAMS Accession No. ML12090A870.
- FEMA/NRC Memorandum of Understanding (MOU), October 22, 1980 (45 FR 82713, December 16, 1980).
- FEMA/NRC Memorandum of Understanding (MOU) in support of Executive Order 12657, December, 1991.

Other Federal Agency Guidance

- EPA-400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," May 1992.
- EPA, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (Draft for Interim Use and Public Comment)," March 2013.

GLOSSARY

Alert and notification: the process of providing a warning signal to the public at risk indicating the need to seek additional information regarding an emergency event in progress (alerting), followed by informing the public about the nature of the event and any protective actions (notification).

Alert and notification system (ANS): the system used to alert and notify the public, including the physical means (equipment and methods) and administrative means (organizational responsibility and interaction of responsible organizations for alert and notification).

Alert: an ECL indicating that events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of intentional malicious dedicated efforts of a hostile act. Any releases are expected to be limited to small fractions of the EPA PAG exposure levels.

Annual: once every calendar year.

Applicant: an entity that has applied for a NPP construction permit/operating license under 10 CFR Part 50, COL under 10 CFR Part 52, or a certain type of ESP under 10 CFR Part 52.

Buffer zone: an area adjacent to a restricted zone where residents may temporarily re-enter, but for which protective measures are recommended to minimize exposure to radiation. The buffer zone serves as an area in which response and recovery efforts are staged and coordinated, and provides an area to conduct decontamination efforts to prevent the spread of contamination to unrestricted areas.

Combined license (COL): a joint construction permit and operating license with conditions for a nuclear power facility issued under Subpart C of 10 CFR Part 52.

Command and control: management of emergency functions within a particular context (e.g., an EOC) through leadership and use of authority.

Commercial nuclear power plant (NPP): a facility licensed by the NRC to use a nuclear reactor to produce electricity.

The Commission: a collegial body that formulates policies, develops regulations, and issues orders regarding U.S. nuclear reactor and nuclear material safety. The Commission is made up of five Commissioners appointed by the President and confirmed by the Senate for five-year terms.

Concept of operations: delineation of an organization's roles and responsibilities and how the organization will function to accomplish those responsibilities.

Containment: the provision of a gas-tight shell or other enclosure around a reactor that confines fission products and prevents their release to the environment in an accident.

Contamination: radioactive material present in an unintended area or location.

Continuous: action carried out without stopping or interruption.

Control room: the area in a NPP from which most of the plant power production and emergency safety equipment can be operated by remote control.

Corrective action: concrete, actionable steps that are intended to resolve emergency preparedness program gaps and shortcomings experienced in exercises or actual events.

Curie (Ci): a unit used to measure the intensity of radioactivity in a sample of material, equal to 37 billion (3.7×10^{10}) disintegrations per second.

Decontamination: a process used to reduce, remove, or neutralize radiological, chemical, or biological contamination to reduce the risk of exposure.

Derived intervention level (DIL): corresponds to the amount of radiation in food throughout the relevant time period that, in the absence of any intervention, could lead to an individual receiving a radiation dose equal to the PAG or, in international terms, the intervention levels of dose.

Direct-reading dosimeter (DRD): a small ionization detection instrument that indicates radiation exposure directly. An auxiliary charging device is usually necessary. A DRD can be read in real time by the user. A DRD is also referred to as a "pocket dosimeter."

Dose rate: the amount of energy that ionizing radiation sources deposit in materials through which they pass per unit of time. Dose rate is measured in units of radiation-absorbed dose (rad) per unit of time. The dose rate may be expressed numerically in rads per second or rads per hour.

Dosimeter: a small portable instrument (such as a film badge, thermoluminescent dosimeter, or pocket dosimeter) used to measure and record the total accumulated personal dose of ionizing radiation.

Dosimetry: the theory and application of the principles and techniques involved in measuring and recording doses of ionizing radiation.

Drill: an event involving organizational responses to a simulated incident used to develop and maintain key skills for emergency response.

Drywell: the containment structure enclosing the vessel and recirculation system of a boiling water reactor. The drywell provides both a pressure suppression system and a fission product barrier under accident conditions.

Early site permit (ESP): a permit through which the NRC resolves site safety, environmental protection, and emergency preparedness issues, in order to approve one or more proposed sites for a nuclear power facility, independent of a specific nuclear plant design or an application for a construction permit or COL. An ESP is valid for 10 to 20 years, but can be renewed for an additional 10 to 20 years.

Emergency action level (EAL): a pre-determined, site-specific, observable threshold for an initiating condition that, when met or exceeded, places the plant in a given ECL.

Emergency classification level (ECL): one of a set of names or titles established by the NRC for grouping off-normal events or conditions according to potential or actual effects or consequences and resulting onsite and offsite response actions. The four ECLs used for commercial NPPs, in ascending order of severity, are: Notification of Unusual Event (NOUE), Alert, SAE, and GE.

Emergency operations center (EOC): a facility that is the primary base of emergency operations for an ORO in a radiological incident.

Emergency operations facility (EOF): a facility that is the primary base of emergency operations for the licensee in a radiological incident to facilitate the management and coordination of overall emergency response.

Emergency planning zone (EPZ): a geographic area surrounding a commercial NPP for which emergency planning is needed to ensure that prompt and effective actions can be taken by OROs to protect public health and safety in the event of a radiological incident. The plume exposure pathway EPZ is approximately 10 miles in radius, while the ingestion exposure pathway EPZ has a radius of approximately 50 miles.

Emergency Response Data System (ERDS): a direct near real-time electronic data link between the licensee's onsite computer system and the NRC Operations Center that provides for the automated transmission of a limited data set of selected plant parameters. The ERDS is activated by the facility upon declaration of an Alert or higher ECL.

Emergency response network: generic term used to refer to communications systems including the hardwired and wireless telephone networks, broadcast and cable television, radio, Public Safety Land Mobile Radio, satellite systems, and increasingly the Internet.

Emergency response organization (ERO): the personnel assigned to perform tasks and activities associated with implementation of a licensee's emergency plan for coping with radiological incidents.

Environmental Protection Agency (EPA): the organization responsible for coordinating Federal environmental response and cleanup for nuclear/radiological incidents.

Evacuation time estimate (ETE): a calculation of the time it would take to evacuate the public within the plume exposure pathway EPZ under emergency conditions.

Evaluation: the process of observing exercise performance to identify strengths and opportunities for improvement in an entity's emergency preparedness and response capabilities.

Exclusion area: the area surrounding the reactor where the licensee has the authority to determine all activities, including exclusion or removal of personnel and property.

Exercise: an event involving a simulated commercial NPP incident that tests the integrated organizational response capabilities and a major portion of the basic elements of emergency plans.

Federal Emergency Management Agency (FEMA): the agency responsible for establishing Federal policies for and coordinating emergency planning, management, mitigation, and assistance functions of executive agencies. FEMA assists state, local, and tribal agencies in their emergency planning. Its primary role is one of coordinating Federal, state, local, tribal, and volunteer response actions. FEMA became part of the U.S. Department of Homeland Security (DHS) in 2003.

Federal organization: an agency or department of the U.S. Federal government, or its component(s), having a role in emergency planning and preparedness.

Federal Radiological Monitoring and Assessment Center (FRMAC): a center usually located near the scene of a radiological emergency from which the Department of Energy conducts the NRF response. This center need not be located near the licensee or Federal-state operations centers as long as its operation can be coordinated with them.

Field monitoring team (FMT): a group used to detect and monitor radiation in the environment (e.g., measure radiation levels in the air, water, vegetation, soil, etc.).

Federal Radiological Preparedness Coordinating Committee (FRPCC): the National-level coordination mechanism to provide technical assistance to OROs (see 44 CFR Part 351).

General Emergency (GE): an ECL indicating that events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or security events that result in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

Hostile action: an act directed toward a NPP or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.

Health physics (HP): the science concerned with recognizing and evaluating the effects of ionizing radiation on the health and safety of people and the environment, monitoring radiation exposure, and controlling the associated health risks and environmental hazards to permit the safe use of technologies that produce ionizing radiation.

Implementing procedure: instructions that provide a detailed description, often including checklists, of the operations that are to be conducted by either a specific group of individuals or a designated position.

Incident: a natural or man-made occurrence that requires a response to protect life or property. Incidents can include major disasters, emergencies, terrorist attacks, terrorist threats, civil unrest, wildland and urban fires, floods, hazardous materials spills, nuclear accidents, aircraft accidents, earthquakes, hurricanes, tornadoes, tropical storms, tsunamis, war-related disasters, public health and medical emergencies, and other occurrences requiring an emergency response.

Ingestion exposure pathway: the principal exposure from this pathway would be from ingestion of contaminated water or foods, such as milk or fresh vegetables. The duration of potential exposure could range in length from hours to months to even years.

Ingestion exposure pathway emergency planning zone: a geographic area, approximately 50 miles in radius surrounding a commercial NPP, in which the health and safety of the general public could be adversely affected through the ingestion of water or food that has been contaminated through exposure to radiation, primarily from the deposition of radioisotopes after a radiological accident.

Initiating condition: a plant state or situation that indicates a radiological emergency, or event(s) that could lead to a radiological emergency, has occurred.

Institutionalized individual: a person who resides in an institution, such as a nursing home or correctional facility, and who may need to depend on others for assistance with taking protective actions. An institutionalized individual may or may not have disabilities and access/functional needs.

Joint information center (JIC): a centralized location for news media at or near the scene of a NPP incident to obtain information regarding onsite/offsite conditions, response organization activities, and any public protective actions; under specific circumstances, the JIC may be a virtual location. News media representatives are kept informed of activities and events via public information officials from the licensee and participating Federal, state, local, and tribal agencies, which ideally are collocated at the JIC.

Joint information system (JIS): a structured approach that integrates incident information and public affairs into a cohesive organization designed to provide consistent, coordinated, accurate, accessible, timely, and complete information during a crisis or incident. The purpose of a JIS is to provide a structure and system for developing and delivering coordinated interagency messages; developing, recommending, and executing public information plans/procedures and strategies on behalf of the Incident Commander; advising the incident command concerning public affairs issues that could affect a response effort; and controlling rumors and inaccurate information that could undermine public confidence in the emergency response effort. The JIC is a central location that facilitates operation of the JIS.

KI (potassium iodide): see potassium iodide.

Key skill: a capability necessary for implementing emergency response functions to protect public health and safety. For applicants/licensees, a listing of ERO key skills is provided in Appendix E of 10 CFR Part 50.

Letter of agreement (LOA): a document executed between two or more parties outlining specific arrangements relating to the accomplishment of an action. Letters of agreement may cover personnel, equipment, or other types of emergency support, and may take the form of letters, contracts, purchase orders, or other procurement mechanisms.

Licensee: the utility or organization that has received from the NRC (1) a license to construct or operate a commercial NPP, (2) an ESP for a commercial NPP, (3) a combined license for a commercial NPP, or (4) any other NRC license that is now or may become subject to requirements for radiological emergency planning and preparedness activities.

Licensee ORO: refers to a situation in which a licensee develops plans for and would implement offsite emergency response activities and functions because state, local, and/or tribal organizations have declined to participate in the REP program.

Local organization: a municipal, county, or regional government agency or office having a role in radiological emergency planning and preparedness, as defined in radiological emergency response plans.

Medical services drill: a drill in which OROs demonstrate the ability of the transportation services and medical facilities to handle a contaminated individual without spreading contamination.

Memorandum of understanding (MOU): a document which details the respective authorities and responsibilities of the signatory organizations for specified radiological emergency response planning, preparedness, or response.

Microcurie (µCi): one millionth part of a curie (see curie).

Mitigation: the capabilities necessary to reduce the loss of life and property by lessening the impact of a NPP incident or other disaster.

National Preparedness Goal: the objective to provide for a secure and resilient Nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.

National Preparedness System (NPS): an integrated set of guidance, programs, and processes to enable the Nation to meet the National Preparedness Goal.

National Response Framework (NRF): the guiding principles, roles, and structures that enable all domestic incident response partners to prepare for and provide a unified national response to disasters and emergencies. It describes how the Federal government, states, tribal governments, communities, and private sector work together to coordinate a national response. The framework builds upon the NIMS, which provides a template for managing incidents.

Non-participating organization: an ORO that is not participating in emergency planning and preparedness for incidents at a commercial NPP.

Notification of Unusual Event (NOUE): an ECL indicating that events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs. This term is sometimes shortened to Unusual Event (UE) or other similar site-specific terminology. The terms Notification of Unusual Event, NOUE, Unusual Event, and UE are used interchangeably.

NRC site team: NRC regional personnel who may be activated for onsite assessment and face-to-face coordination with licensee, state, and Federal responders.

Nuclear Regulatory Commission (NRC): the Federal agency that regulates commercial NPPs and other uses of nuclear materials, such as in nuclear medicine, through licensing, inspection, and enforcement of its requirements.

NUREG: reports or brochures on regulatory decisions, results of research, results of incident investigations, and other technical and administrative information.

Offsite: outside the boundaries of the OCA.

Offsite response organization (ORO): any state, local, or tribal governmental organization; private or voluntary organization; or licensee ORO formed when state, local, and tribal governments choose not to participate in the REP Program; that is responsible for carrying out emergency response functions during a radiological emergency.

Onsite: the OCA of a commercial NPP.

Operations support center (OSC): a licensee onsite emergency response facility provided for maintenance and other support personnel to gather as a ready resource to support emergency response actions.

Owner controlled area (OCA): all areas contiguous to the commercial NPP that are owned or leased by the licensee (or by any of its associated business units) over which the licensee exercises control. The OCA is usually larger than, and encompasses, the exclusion area.

Pet: a domesticated animal, such as a dog, cat, bird, rabbit, rodent, or turtle that is traditionally kept in the home for pleasure rather than for commercial purposes, can travel in commercial carriers, and be housed in temporary facilities. Household pets do not include reptiles (except turtles), amphibians, fish, insects/arachnids, farm animals (including horses), and animals kept for racing purposes.

Person with disabilities and access/functional needs: an individual within a community that may have additional needs before, during, and/or after an incident in one or more of the following functional areas: maintaining independence, communication, transportation, supervision, and medical care. Individuals in need of additional response assistance may include those who have disabilities (sensory, motor skills, mental/emotional); who live in institutionalized settings; who are elderly; who are children; who are from diverse cultures; who have limited or no English-speaking proficiency; or who are transportation-disadvantaged.

Planning standard: an emergency planning element or attribute that must be met in onsite and offsite emergency plans and preparedness programs. The planning standards are found in NRC regulations at 10 CFR 50.47 and FEMA regulations at 44 CFR 350.5.

Plans/Procedures: an organization's documented concept of operations and implementing instructions for managing its internal response to emergencies and coordinating its external response with other organizations. The term plans/procedures as used in this document includes REP/response plans, associated implementing procedures, and other supporting and referenced materials.

Plume exposure pathway: a term describing the means by which whole body radiation exposure occurs as a result of immersion in a gaseous release of radioactive material. The principal exposure sources from this pathway are: (a) whole body external exposure to gamma radiation from the plume and from deposited materials, and (b) inhalation exposure from the passing radioactive plume. The duration of principal potential exposures could range in length from 30 minutes to days.

Plume exposure pathway emergency planning zone: a geographic area approximately 10 miles in radius surrounding a commercial NPP within which the health and safety of the general public could be adversely affected by direct whole body external exposure to gamma radiation from the plume and from deposited materials, as well as inhalation exposure from the passing radioactive plume during a radiological accident.

Post-plume phase: includes response activities (such as limiting exposure from ingestion of contaminated food and water, relocation, reentry, and return) that occur after a release has been terminated.

Potassium iodide (KI): a prophylactic compound containing a stable (i.e., non-radioactive) form of iodine that can be used effectively to block the uptake of radioactive iodine by the thyroid gland in a human being.

Principal organization: the nuclear utility (licensee) and any Federal, state, local, and tribal agency, department, or executive office having a major or lead role in emergency planning and preparedness.

Private sector organization: an industry group or entity, volunteer group, quasi-governmental body, etc. having a role in emergency planning and preparedness.

Projected dose: an estimate of the amount of radiation exposure which affected individuals could potentially receive if protective actions are not taken.

Protective action: an action taken to avoid or reduce projected dose. See also protective measure.

Protective action decision (PAD): measures taken in anticipation of, or in response to, a release of radioactive material to the environment. The purpose of PADs is to provide dose savings by avoiding or minimizing the radiation exposure received by individuals, thereby minimizing the health risks resulting from radiation exposure. Sheltering and evacuation are the two PADs most often relied upon for limiting the direct exposure of the general public within the plume exposure EPZ. Preventive and emergency PADs are two categories of PADs relied upon for limiting exposure from contaminated food and water in the ingestion exposure EPZ.

Protective action guide (PAG): a projected dose to an individual in the general population that warrants the implementation of protective action.

Protective action recommendation (PAR): a formal advisement from a NPP licensee to state, local, and/or tribal government officials, or from state officials to other offsite officials, concerning emergency measures that should be taken to protect the public from exposure to radiation.

Protective measure: an action taken in the event of a radiological emergency at a NPP to protect the public from exposure to radiation.

Public information: information provided to the general public on a periodic basis concerning what they should know about radiation and how to respond to a radiological emergency. This would include topics such as educational information about radiation, who to contact for additional information, and what their actions should be in an actual emergency.

Rad: radiation absorbed dose, the basic unit of absorbed radiation dose. One rad is equal to an absorbed dose of 100 ergs per gram of the absorbing material or tissue.

Radioisotope: an unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation. Approximately 5000 natural and artificial radioisotopes have been identified.

Radiological Emergency Preparedness (REP) Program: refers to both FEMA and NRC programs that administer emergency preparedness for commercial nuclear sites and surrounding areas and encompasses the plans, training, exercises, and resources necessary to prepare emergency personnel to rapidly identify, evaluate, and respond to emergencies.

Radiological Emergency Preparedness (REP) exercise: an event involving organizational responses to a simulated commercial NPP incident with radiological and other offsite consequences. The purpose of an exercise is to test the integrated capabilities of onsite and offsite response organizations to implement emergency functions set forth in their radiological emergency response plans/procedures.

Radioprotective drug: a chemical compound or substance serving to protect or aid in protecting against the injurious effects of radiation.

Reasonable assurance: a determination that state, local, tribal government, and utility offsite plans and preparedness are adequate to protect public health and safety in the emergency planning areas of commercial NPPs.

Reception/relocation center: a pre-designated facility located outside the plume exposure pathway EPZ (at a minimum distance of 15 miles from the NPP) at which the evacuated public can register; receive radiation monitoring and decontamination; receive assistance in contacting others; receive directions to congregate care centers; reunite with others; and receive general information. It generally refers to a facility where monitoring, decontamination, and registration of evacuees are conducted. A reception/relocation center is also referred to as a registration center or public registration and decontamination center.

Recovery: the process of reducing radiation exposure rates and concentrations of radioactive material in the environment to acceptable levels for return by the general public for unconditional occupancy or use after the emergency phase of a radiological emergency. More broadly, recovery is accomplished through the timely restoration, strengthening, and revitalization of infrastructure, housing, and a sustainable economy, as well as the health, social, cultural, historic, and environmental fabric of communities affected by a catastrophic incident.

Re-entry: the provisions for the return of the public after evacuation, when the radiation risk has been reduced to acceptable levels.

Regional Assistance Committee (RAC): a committee of representatives from a number of Federal agencies that have agreed to assist the FEMA Region in providing technical assistance to OROs and to evaluate radiological emergency response plans/procedures and exercises on the basis of their special authorities, missions, and expertise.

Relocation: the removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure.

Relocation center: see reception/relocation center.

Return: reoccupation of areas cleared for unrestricted residence/use by previously evacuated or relocated populations.

Roentgen (r): a unit of exposure of gamma (or X-ray) radiation in field dosimetry. One roentgen is essentially equal to one rad (see "rad"). A unit for measuring the amount of radiation energy imparted to a volume of air. The roentgen can be used only to measure X-rays or gamma rays.

Roentgen equivalent man/mammal (rem): the quantity of ionizing radiation of any type which, when absorbed by man or other mammals, produces a physiological effect equivalent to that produced by the absorption of 1 roentgen of X-ray or gamma radiation.

Service animal: any guide dog, signal dog, or other animal individually trained to provide assistance to an individual with a disability including, but not limited to, guiding individuals with impaired

vision, alerting individuals with impaired hearing to intruders or sounds, providing minimal protection or rescue work, pulling a wheelchair, or fetching dropped items.

Site Area Emergency (SAE): an ECL indicating that events are in process or have occurred which involve an actual or likely major failure of plant functions needed for protection of the public or security events that result in intentional damage or malicious acts toward site personnel or equipment that could lead to the likely failure of, or that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.

Site boundary: the line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee.

Spent fuel pool: a structure that provides onsite storage for spent nuclear fuel. These pools are robust constructions made of reinforced concrete several feet thick, with steel liners. The water is typically about 40 feet deep, and serves both to shield the radiation and cool the fuel rods.

State organization: the state government agency or office having the principal or lead role in emergency planning and preparedness. There may be more than one state involved, resulting in application of the evaluation criteria separately to more than one state. To the extent possible, however, one state should be designated as lead.

State of emergency: a situation of national danger or disaster in which a government suspends normal constitutional procedures in order to regain control.

Support organization: any organization, such as an agency, department, office, or local jurisdiction, having a supportive role to the principal or lead organization(s) in emergency planning and preparedness.

Technical support center (TSC): a licensee onsite facility that provides plant management and technical support during an emergency and performs EOF functions until the EOF is functional.

Threat and Hazard Identification and Risk Assessment (THIRA): a comprehensive guide to identifying and addressing risks and impacts through the whole community approach; this is a joint effort between Federal, state, local, tribal, and territorial organizations.

Timely (timely manner): performing appropriate actions with a sense of urgency and without undue delay.

Total effective dose equivalent (TEDE): the sum of the deep dose equivalent (for external exposures) and committed effective dose equivalent (for internal exposures).

Transient person: a person who does not permanently reside in the plume exposure pathway EPZ, but may be present during an emergency.

Tribal government: a Federally-recognized American Indian and Alaska Native tribal government. Tribal governments do not have the authority to directly request Stafford Act assistance and must seek assistance under Presidential Declarations for the states in which they are located. A listing of Federally-recognized Indian tribal entities can be found in the Tribal Directory maintained on the US Department of the Interior, Indian Affairs' webpage (www.bia.gov).

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NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," is a joint NRC and FEMA guidance document. Both agencies use the document to evaluate the adequacy of the emergency plans and preparedness of state, local, and tribal governments within the emergency planning zones (EPZs) surrounding commercial nuclear power plants (NPPs), as well as those of the commercial NPP applicants and licensees. The guidance describes methods that NRC and FEMA staff consider to be acceptable for use in implementing specific parts of each agency's regulations, and may also be used by stakeholders in the preparation of emergency plans. This NUREG-0654/FEMA-REP-1, Rev. 2 update reflects changes to both NRC and FEMA regulations, guidance, and policies, as well as advances in technology and best practices that have occurred since the document was originally issued in November 1980. This update also incorporates the four supplemental documents and addenda that have been issued in the intervening years, and is intended to modernize the guidance while lessening administrative burden on users.

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